

A
T R E A T I S E
O N
R U P T U R E S.

By PERCIVALL POTT,
SENIOR SURGEON

To St. BARTHOLOMEW's Hospital.

*Chirurgia non quidem medicamenta atque victus rationem
omittit, sed manu tamen plurimum præstat; estque ejus
effectus inter omnes medicinæ partes evidentissimus.*

A. CORN. CELSUS.

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P R E F A C E.

THE disease which makes the subject of the following tract, is one in which mankind are, on many accounts, much interested; no age, sex, rank, or condition of life is exempt from it; the rich, the poor, the lazy, and the laborious, are equally liable to it; it produces certain inconvenience to all who are afflicted by it; it sometimes puts the life of the patient in such hazard, as to require one of the most delicate operations in surgery; and it has in all times, from the most antient, down to the present, rendered those

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who

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who labour under it subject to the most iniquitous frauds and impositions,

The generality of mankind look upon a rupture as an imperfection in their form, as a disease which impairs their strength, and lessens their generative faculty; which apprehensions, tho' absolutely groundless, are so firmly rooted, in the majority of those who are afflicted with the disorder, as to make them not a little miserable: they who lie in wait to avail themselves of the weaknesses of the infirm and fearful, are well acquainted with these fears, and very lucrative use do they make of them; they well know, that the man who regards his disorder as an imperfection in his form, or as a cause of any debility, more particularly a venereal one,

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one, will be very unwilling to have it known, and as glad to get rid of it, at any expence or trouble ; by this means these impostors are furnished with opportunities of subjecting the ignorant, and credulous, to tedious confinements, painful applications, and even hazardous operations ; and of defrauding the timorous, and bashful, of large sums of money, for imaginary diseases, and pretended cures.

Complaints of this sort, coming from the profession, are generally ill received, and being set to the account of prejudice, interest, and craft, are very little regarded ; but in this mankind do us great injustice. A rupture is a disease, which, if judiciously and honestly treated from the first, can never be productive of

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much profit to a surgeon; it requires very little attendance, and neither external application, nor internal medicine; tho' the reduction of the gut, and the application of a proper bandage, are necessary, yet this is in general so soon, and so easily accomplished, that it must be obvious that no great emolument can from thence be derived; and therefore, if the profession may be allowed to be impartial in any thing which relates to themselves, I think they may in this, from which they never can reap considerable profit, unless the disease has been greatly neglected or ill treated: it is from fraud and delusion principally that such advantage can be derived; it is from the patient's ignorance of the true nature of his disorder, and from bold and lying promises made of a perfect cure.

It

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It is far from my intention to defend the body of surgeons from any accusation which may justly be brought against them; but as the reason given by most of the patrons of quackery for their supporting it, is, that the medical world thro' mere obstinacy, never depart from the customs of their ancestors, nor attempt any thing new, tho' mankind might be much benefited by such inventions, and as I think that such imputation cannot with any colour of justice be made against us, I would beg leave to be indulged a few words on this subject.

That the merit of many of the old practitioners was great; that they left behind them many proofs both of their sagacity, and their dexterity; that we have received large informa-

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tion from their writings; and that, *cæteris paribus*, he who is best acquainted with them will be the best surgeon, is well known to every one who is at all conversant with them, and can be denied only by those who are not. But, on the other hand, it must also be allowed, that both their theory and their practice laboured under great disadvantages, which rendered their judgment of many diseases erroneous, and their treatment of them irrational and unsuccessful.

The very imperfect state of their anatomy was one great source of error; which kind of knowledge has been so cultivated in our times as to convert ignorance into a vice, and to render those who are deficient in it perfectly inexcusable.

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As this is the only true and solid basis from which all chirurgical knowledge must for ever spring, so it has of late years been productive of many real, and great improvements in the art.

The antient surgery was coarse, and loaded with a farrago of external applications, some of which were horridly, and yet unnecessarily painful, and others altogether useless; whilst the operative part of the art was encumbered with a multitude of awkward, unmanageable instruments, and pieces of machinery.

The practitioners of the present time have brought the practice into a much narrower compass, have rendered it less painful and more intelligible; they have reduced the num-

ber of instruments, and by the extreme simplicity of those which they now use, they have considerably assisted the dexterity of an operator, and shortened the time of an operation; they have almost thrown aside the burning cautery, and are much more sparing in the use of caustic applications than their predecessors used to be; they now accomplish many cures by mild and gentle means, which formerly were thought not obtainable but by much severity; to say nothing of the indelible marks which such practice left behind it. The havock formerly made both of limbs and lives by the use of long forceps in gun-shot wounds; the explosion of the long prevailing notion that such wounds were poisonous; the easy superficial method with which they are now in general treated,

ed, and the opportunities which such treatment gives for nature to exert those powers with which the Almighty Author has furnished her, do credit to the modern practitioners: the double incision in amputations; the present method of removing cancerous breasts, and encysted tumors; the lateral operation for the stone in the bladder; the use of the cutting gorget; amputation in the joint of the shoulder; the present method of letting out all the water at once from an ascites; the improvements in the treatment of the fistula lachrymalis; the cure of the vari and valgi, with many others which might be named; in short, the superior neatness, ease, and expedition of the present surgery, when compared to the antient, are certain and undoubted improvements made by the modern practi-

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practitioners, and such as mankind are much benefited by, as their pains are thereby lessened, the elegance of their figure preserved, and the time of their confinement shortened; all which will, I presume, be allowed to be advantages, while human nature shall remain sensible of pain, while scars shall be thought deformities, or confinement be deemed irksome.

Nor is our conduct, with regard to the particular disease which makes the subject of the following tract, in the least degree blameable; so far from it, that the treatment which we meet with sometimes is most singularly unjust, we being often severely censured for that, from which we ought to derive praise: so little do we deserve the reflection cast upon us, of being content with what our
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fathers taught us, and neither improving the art ourselves, nor encouraging those who do; that, on the contrary, much pains have been taken to improve this particular part of surgery, and the publick ought to thank us for not persevering in the use of the old, tedious, painful, and hazardous processes, after we found them to be in general ineffectual.

But tho' I would at all times vindicate the profession from every unjust attack, I would by no means be supposed to think that there is not large room left for the industry both of us and our successors; some of the operative parts of the art are still capable of improvement, and the treatment of some diseases might certainly be altered for the better.

Whether

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Whether our future labours shall be crowned with success or not, still I think it will appear to every one at all versed in the history of surgery, that the practitioners of the present time are so far from deserving the character which they who know nothing of the art have given of them, that they really deserve a very contrary one; since, instead of obstinately adhering to the practice of their ancestors, they have differed from it in many instances, where they found they could do it with safety, and to the advantage of mankind; and have endeavoured to advance the utility of their profession, by the only means whereby it is capable of being improved, viz. by a sedulous application to anatomy, by the frequent examinations of dead morbid bodies, and by making such
expe-

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experiments on the living, as they had just reason to think would prove beneficial; candidly acknowledging at the same time where they have found their art insufficient, and not persisting in tormenting their fellow-creatures merely for gain.

In the following treatise I have endeavoured to express myself in as plain, explicit, and intelligible a manner as I am able, and the subject will admit; being desirous as much as I can to inform mankind of the true nature of the disease, of the danger they incur, and the frauds they are liable to, from the ignorance of one set of quacks, and the worse qualities of another; to show what the art of surgery in judicious hands is capable of doing, and how essentially the conduct of an impostor

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postor differs from that of an honest man, who will never be ashamed of confessing that he cannot do what is not in his power.

In the former edition of this book were many faults; some of the press, some of the author; in this some pains have been taken to lessen both; the typographical errors are, I think, now but few, and wherever it has appeared to me that the matter of the treatise was obscure, erroneous, or deficient, I have altered, corrected, and added to it.

I am still far from thinking that it is perfect or faultless; but, on the other hand, I am not conscious of having advanced any thing in it which is not strictly true, and agreeable to the most successful practice: improve-

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improvement of the art of surgery, and the relief of mankind, are my two principal objects; and if what I have now, or at any other time written, shall be found to have contributed toward accomplishing either of those ends, I hope the reader will excuse all those lesser faults,

— *quas aut incuria fudit,
Aut humana parum cavit natura.*

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S E C T I O N I.

BY the term RUPTURE, DESCENT, or HERNIA, is in general meant a swelling produced by the falling down, or protrusion, of some part, or parts, which ought naturally to be contained within the cavity of the belly.

The places in which these swellings make their appearance, in order to form what is called a RUPTURE, are the groin, the navel, the labia pudendi, the upper and fore part of the thigh, and every point of the anterior part of the abdomen.

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The parts, which by being thrust forth from the cavity, in which they ought naturally to remain, and which form these tumours, are, a portion of the omentum, a part of the intestinal canal, and * sometimes (tho' very rarely) the stomach.

From these two circumstances, of situation, and contents, are derived all the different appellations by which herniæ are distinguished: for example, they are called *inguinal*, *scrotal*, *femoral*, *umbilical*, and *ventral*, as they happen to make their appearance in the groin, cod, thigh, navel, or belly. If a portion of intestine only forms it, it is called *enterocele*, *hernia intestinalis*, or gut-rupture; if a piece of omentum only, *epiplocele*, *hernia omentalis*, or caul-rupture; and if both intestine and omentum contribute mutually to the formation of the tumor, it is called *entero-epiplocele*, or compound rupture.

If the piece of gut or caul descends no lower than the groin, it is said to be incomplete, and is called *bubonocèle*; if the scrotum be occupied by either of them, the

* The liver, spleen, uterus, bladder, &c. have at different times been found in different herniæ, but these are so rare as not to come within a general description.

RUPTURES.

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the rupture is said to be compleat, and bears the name of *oscheocele*: the latter used by our forefathers to be attributed to laceration of the peritoneum, the former to its dilatation merely:

The opinion, that the scrotal hernia is occasioned by a forcible division, or breach, made in the peritoneum, has always been, and still is, with the unknowing, a very prevailing one, tho' without any foundation in truth; both the scrotal, and femoral, pass out from the abdomen by openings which are natural to every human body; as well those who have not ruptures, as those who have. The former, that is the scrotal, descend by means of an aperture in the tendon of the external oblique muscle, near the groin; designed for the passage of the spermatic vessels in men, and the ligamenta uteri in women; and the latter, under the hollow, made by Poupart's, or Fallopius's ligament, at the upper part of the thigh, along with the great crural vein and artery.

The pair of muscles called *obliqui externi ascendentes*, cover all that part of the belly which is without bone, and the lower and anterior parts of the thorax. They are

B 2

fleshy

fleshy on the sides, and tendinous in the middle, and lower part; they spring from the seventh and eighth ribs, and from all below them, by fleshy portions, which indigitate with corresponding parts of two other muscles, called the serratus major anticus, and the latissimus dorsi, and becoming tendinous, are inserted into what is called the linea alba, the spine of the os ilium, and into the os pubis.

At the lower part of the belly, on each side, a little above the last mentioned bone, the fibres of the tendon of this muscle separate from each other, and form thereby two apertures, thro' which pass the spermatic vessels in men, and the ligamenta uteri in women. These openings are of an oval figure, and have an oblique direction from above downward; the upper part of them is rather wider than the lower, and they are of larger size in men than in women.^b

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^b A detachment of fibres from the fascia lata of the thigh is generally united with the tendon composing the aperture in the obliquus externus, which mixture or connexion of fibres, will in some measure account for the pain which they who labour under strangulated ruptures feel upon standing upright, and the relief which bending the thigh upward toward the belly always gives them.

The tendinous fibres of this muscle, as they proceed from its fleshy part obliquely downward, have several small apertures for the passage of vessels and nerves; and at their insertion into the os pubis, they cross one another, and are as it were interwoven, by which means their insertion is strengthened, and their attachment made firmer.

What is called by the particular name of Poupart's ligament is really nothing more than the lower border of this tendon, stretched from the fore part of the os ilium, or haunch-bone, to the os pubis, and turned, or folded inward at its inferior edges.

The other muscles of the belly are the obliquus internus, the transversalis, the rectus, and the pyramidalis, none of which have any concern with our present subject. The spermatic chord does indeed pass under the lower edge or border of the two first of these, but at such distance, and in such manner, that no action of these muscles can any way affect, or ever make any stricture either on it, or on a hernia accompanying it; they have no perforations, or apertures, tho' so many writers of credit (even late ones) have both described

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and delineated them,^d consequently they can have no share in the embarrassment of the parts contained in a hernial sac, nor require any division in that operation, which becomes sometimes necessary towards setting them free: which is a fact of no small consequence to an operator.

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^d However incredible and strange it may seem, yet I am convinced, that operations have been performed by the information obtained from books only, without any previous anatomical knowledge, any practice on dead bodies, and hardly any, if any, opportunities of seeing such operations performed by others on the living: how grossly must such an operator be deceived by the account of the rings, as they are usually, tho' absurdly, called, of the abdominal muscles: after he has divided the first, or that of the external oblique, he will expect to find a second in the internal, and a third in the transversalis, and will never suppose that he is got into the cavity of the belly, 'till he has divided all the three; it is therefore of the utmost consequence that this matter be set right, and that, notwithstanding what has been said on this subject by writers of great eminence, every surgeon be informed that the external oblique muscle is the only one which has any opening in it; that the description given by Mr. Cheselden of these muscles, in the last edition of his anatomy, is erroneous, and all descriptions and all delineations (some of which are to be found even in late writers) of more openings than that single one on each side, are not representations of nature, but are the images of a luxuriant fancy, and have no foundation in truth.

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The inside of these muscles, and indeed the whole cavity of the belly is lined with a smooth, firm, but easily dilatable membrane, called the peritoneum, a minute account of which would lead me beside my present purpose, and therefore I shall only observe, that it lines the whole abdomen, and gives an external coat to every viscus contained in it.

Behind the peritoneum lies a loose, cellular membrane, by some called its appendix, which is found in different quantity, in different places. In some the cells are empty, and are immediately visible upon being blown into; in other parts it is plentifully stocked with fat, and, tho' somewhat varied in its appearance in different places, is found in most parts of the body.

This cellular membrane, void of fat, surrounding the spermatic vessels, as they pass forth from the cavity of the abdomen into the groin, is called the tunica vaginalis of the chord, or tunica communis vasorum spermaticorum; which chord, thus enveloped, passing under the inferior edge or border of the transversalis, and internal oblique muscles, and thro' the perforations or natural apertures of the external oblique,

B 4

descends

descends thro' the groin to the testicle, in such manner, that the spermatic vessels in their passage from the cavity are really and truly behind the peritoneum.

The tunica vaginalis testis is a membrane perfectly distinct from this, forming a particular cavity which includes the glandular substance of the testicle, and has nothing to do with a common rupture. In every foetus, until, or very near until the time of birth, there is an open and free communication between the cavity of this last tunic, and that of the belly, for the passage of the testicle from the abdomen into the scrotum: soon after birth this passage closes and becomes impervious, nor is there ever after the time of such closing, any communication between the cavity of the belly, and that of the tunica vaginalis testis. But tho' the passage remains in general for ever shut, yet the place where its orifice, or mouth, was, may always be known by a kind of cicatricula, much like to what appears within the abdomen, opposite to the navel, or place where the umbilical vessels of the foetus passed to and from the placenta; at the place of which cicatricula, the peritoneum is generally weaker

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weaker than elsewhere. Now, if it be remembered, that this weak part is necessarily opposite to the natural opening in the tendon of the external oblique muscle, that neither the internal oblique muscle, nor the transversalis come low enough to make any resistance to whatever shall press against this part, and that the acknowledged use of the muscles of the abdomen is by pressing on all its contained viscera to assist digestion, the expulsion of the fæces, urine, and fœtus; and that in many natural actions, such as sneezing and coughing, &c. and in all great exertions of strength and force, our erect posture must necessarily occasion a pressure to be made against the lower part of the inside of the belly, by some of its contents; a very probable and satisfactory account of the origin of the common inguinal and scrotal hernia may be collected.

In young children this descent, or protrusion, happens most frequently when the child strains in crying, or in expelling its fæces: as soon as the effort ceases, and the child is quiet, the part generally returns up again, and the swelling disappears; the nurses call it wind, and it is at first most

frequently neglected, as the child is not apparently injured by it, and few people are sufficiently aware of its possible consequences.

Not that the disease is by any means confined to children: adults frequently are attacked by it, either by falls, strains, great exertions of strength, difficulty of expelling hard fæces, or a general laxity of frame.

Whether the rupture be inguinal, scrotal, or femoral, and whether it consists of intestine, or omentum, or both, the protruded part must carry before it a part of the membrane which lines all the internal surface of the abdominal muscles, or rather the whole cavity of the abdomen, and is called peritoneum. This portion of the peritoneum, including the piece of gut or caul, is known by the name of the *hernial sac*, and is larger, or smaller, according to the quantity of intestine, or omentum, contained in it; it is at first small and thin, and in ruptures which are not of the congenial kind, seldom comes lower than the groin* at first, but by repeated descents it extends

* I will not say positively that all those ruptures which appear in the scrotum of very young children are congenial,

extends itself lower and lower, 'till it gets quite into the scrotum, and still as it is extended in length, it becomes thicker and firmer in texture, 'till in old age, or old ruptures, it is found of very considerable thickness.

As all parts of the peritoneum are of a very extensible, dilatable nature, and as the hernial sac has this property in common with many other parts of the body, of thickening as it extends, it does in some cases stretch to a very considerable size, and contain such a quantity of intestine and omentum as is almost incredible. This circumstance of its becoming thicker as it is more extended is perhaps the reason why some people, and among them the late Mr. Cheffelden, have been of opinion that the sac of a hernia was not an elongation of the peritoneum, but produced like that of an aneurism, and some other tumors, by mere pressure of the common cellular membrane; an opinion, which is manifestly and demonstrably erroneous.

Whether

nial, (that is, have the tunica vaginalis testis for their hernial sac) but all those which I have had an opportunity of examining have proved so; and I believe it would be no very erroneous criterion, whereby to distinguish the common rupture from the congenial, in infants.

Whether the hernial sac in its infant state, while it is very thin, and may possibly have contracted no adhesion to the cellular membrane composing the tunica communis of the spermatic vessels, does ever return back into the belly again, I will not take upon me to determine absolutely, but am much inclined to think it does not, as well from the facility with which the gut or caul most commonly descend after they have been down a few times, as from a fullness which is always to be perceived in the spermatic process of such people as have ever been ruptured. Some few of these I have had opportunities of opening after death, and have always found the sac, either in the groin or scrotum, (plainly a continuation of the peritoneum) remaining firmly attached to, and connected with the tunica communis; nor did I ever see, either in the dead or the living, any reason or authority for the supposition, that it is capable of returning back into the abdomen after it has been fairly pushed out thro' the aperture in the tendon.^f

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^f This is a circumstance of some importance in the general treatment of ruptures. Upon it depends the truth
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I intentionally avoid saying any thing about the old doctrine of the difference between dilatation and laceration of the peritoneum, it being now generally known and acknowledged, that to whatever size the hernial sac may be extended, and however large its contents may be, it is merely dilated, and hardly ever burst or broken. The particular kind of case, which a few years ago gave rise to a sort of renewal of the old doctrine of ruptures by laceration of the hernial sac, viz. that kind of hernia in which the gut and testicle are found in the same bag, and in immediate contact with each other, being now sufficiently known

or falsehood of the late doctrine of the possibility of returning the intestine included in the hernial sac, and confined by such a stricture of the sac itself, as may prove fatal after the gut is fairly got into the abdomen again. A case, of which more than one instance has been given to us, but in which I am much inclined to believe that some mistake has been made, and which I also think may be accounted for in another and more satisfactory manner. Upon this also depends the practicability or impracticability of returning a strangulated piece of gut back into the belly, after having divided the stricture made by the tendon, without opening the hernial sac, and consequently the propriety or impropriety of making such attempt. All endeavours to do what is impracticable, being in cases of importance much worse than doing nothing.

known and explained. See Sect. X. of this Tract.

THE signs, or marks, of a common inguinal or scrotal rupture, are in general a swelling in the upper part of the scrotum, or in the groin, beginning at the opening in the abdominal muscles where the spermatic vessels pass down from the belly; which tumor has a different appearance, and different feel, according to the nature of its contents, and to the state and quantity of them.

If a portion of intestine forms it, and that portion be small, the tumor is small in proportion; but tho' small, yet if the gut be distended with wind, inflamed, or have any degree of stricture made on it, it will be tense, resist the impression of the finger, and give pain upon being handled. On the contrary, if there be no stricture made by the tendon, and the intestine suffers no degree of inflammation, let the prolapsed piece be of what length it may, and the tumor of whatever size, yet the tension will be little, and no pain will attend the handling it; upon the patient's coughing, it will feel as if it was blown into, and in
general

general it will be found very easily returnable.

If the hernia be of the omental kind, the tumor has a more flabby and a more unequal feel; it is in general perfectly indolent, is more compressible, gives the scrotum a more oblong, and less round figure, than it bears in an intestinal hernia; and if the quantity be large, and the patient adult, it is in some measure distinguishable by its greater weight.

If it consists of both intestine and omentum, the characteristic marks will be less clear than in either of the simple cases, but yet will to any body who is accustomed to these diseases be sufficiently so, to enable them to distinguish it from any other complaint.

The only diseases with which a true hernia can be confounded, are the *venereal bubo*, the *hydrocele*, and that defluxion on the testicle, called *hernia humoralis*; from each of which it is certainly very distinguishable.

The circumscribed incompressible hardness, the situation of the tumor, and its being free from all connection with the

sper-

spermatic process, will sufficiently point out the first, at least while it is in a recent state; and when it is in any degree suppurated, he must have a very small share of the *tactus eruditus*, who cannot feel the difference between matter, and either a piece of intestine, or omentum.

The perfect equality of the whole tumor, the freedom and smallness of the spermatic process above it, the power of feeling the spermatic vessels, and the vas deferens in that process, its being void of pain upon being handled, the fluctuation of the water, the gradual formation of the swelling, its having begun below and proceeded upwards, its not being affected by any posture or action of the patient, nor increased by his coughing or sneezing, together with the absolute impossibility of feeling the testicle at the bottom of the scrotum,* will always to any intelligent person

* By this remark it may possibly be thought that I mean to say, that the testicle is always to be felt at the bottom of the scrotum in a true hernia; which in general is true, but not without some exceptions. In recent ruptures, of the common kind, whether of the gut, or caul, while the hernial sac is thin, has not been long, or
very

person prove the disease to be a *hydrocele* of the *tunica vaginalis testis*.

And in the *hernia humoralis*, the pain in the testicle, its enlargement, the hardened state of the epididymus, and the exemption of the spermatic chord from all unnatural fullness; are such marks as cannot easily be mistaken; not to mention the generally preceding gonorrhea. But if any doubt still remains of the true nature of the disease, the progress of it from above downward, its different state and size in different postures, particularly lying and standing, together with its descent and ascent, will, if duly attended to, put it out of all doubt, that the tumor is a *true hernia*.

If an attempt be made for the reduction of the rupture, and it consisted of a piece of intestine, it generally slips up all at
C once.

very much distended, and the scrotum still preserves a regularity of figure; the testicle may almost always be easily felt at the inferior and posterior part of the tumor; but in old ruptures, which have been long down, in which the quantity of contents is large, the sac considerably thickened, and the scrotum of an irregular figure, it often happens that the testicle is not to be felt, neither is it in general easily felt in a *congenial hernia*, for a very obvious reason.

once. In its return it makes a kind of guggling noise, and when it is up, the scrotum and process will be found free from any præternatural fullness. If a portion of omentum formed it, it retires more gradually, without any of the noise of the former, and requires to be followed by the finger to the last. If both gut and caul contributed to the formation of it, the gut generally goes up first, and leaves a flabby irregular kind of body behind it, which still possesses the process or scrotum, according as the disease was bubonocèle, or orchocèle, and requiring still farther compression, at last ascends.

The intestine said to be most frequently found in a scrotal hernia, is the ileum, tho' it is also allowed that the cœcum, and part of the colon, have been met with.

This is one of the many maxims which writer receives from writer, and inattentive readers all believe.

That a portion of the ileum does often descend in a hernial sac is beyond all doubt, but that the descent, or more properly protrusion, of a part of the cœcum and colon is rare, is not true, for it happens very frequently. Perhaps it would
not

not bear to be established as a general rule; but from what has fallen within my observation, in frequently performing the operation for a strangulated rupture, it has appeared to me, that the greater number of those in whom it has become necessary (all attempts to reduce the parts by hand having proved fruitless) have consisted of the cœcum with its appendicula, and a portion of the colon. Nor will the size, disposition, and irregular figure of this part of the intestinal canal, appear upon due consideration a very improbable cause of the difficulty or impossibility of reduction by the hand only.

I have already mentioned the principal circumstances by which hernias are distinguishable from other diseases. But it is also to be observed that the same kind of rupture in different people, and under different circumstances, wears a very various face; the age and constitution of the subject, the date of the disease, its being free, or not free from stricture, or inflammation, the symptoms which attend it, and the probability or improbability of its being returnable, necessarily producing much variety; the degree of hazard attending this

complaint will be also more or less as it shall happen to be circumstanced.

If the subject be an infant, the case is not often attended with much difficulty, or hazard; the softness and ductility of their fibres generally rendering the reduction easy as well as the descent; and tho' from neglect or inattention it may fall down again, yet it is as easily replaced, and seldom produces any mischief: I say seldom, because I have seen an infant, one year old, die of a strangulated hernia, which had not been down two days, with all the symptoms of mortified intestines.

If the patient be adult, and in the vigor of life, the consequences of neglect, or of mal-treatment, are more to be feared than at any other time, for reasons too obvious to need relating. The great and principal mischief to be apprehended in an intestinal hernia, is an inflammation of the gut, and an obstruction to the passage of the aliment, and fæces thro' it; which inflammation and obstruction are generally produced by a stricture made on the intestine, by the borders of the aperture in the tendon of the abdominal muscle, thro' which the
hernia

hernia and its sac pass. Now it must be obvious, that the greater the natural strength of the subject is in general, and the more liable to inflammation, the greater probability there must be of stricture, and the more mischief likely to ensue from it. In very old people, the symptoms do not usually make such rapid progress, both on account of the laxity of their frame, and their more languid circulation; and also that their ruptures are most frequently of ancient date, and the passage a good deal dilated; but then, on the other hand, it should also be remembered that they are by no means exempt from inflammatory symptoms, and that if such should come on, the infirmity of old age is no favorable circumstance in the treatment which may become necessary.

If the disease be recent, and the patient young, immediate reduction, and constant care to prevent its pushing out again, are the only means whereby it is possible to obtain a perfect cure.

If the disease be of long standing, has been neglected, or suffered to be frequently down, and has given little or no trouble,

the aperture in the abdominal muscle, and the neck of the hernial sac may both be presumed to be large, which circumstances in general render immediate reduction less necessary and less difficult, and also frustrate all rational expectation of a perfect cure. On the contrary, if the rupture be recent, or tho' old has generally been kept up, its immediate reduction is more absolutely necessary, as the risque of stricture is greater from the supposed smallness of the aperture, and narrowness of the neck of the sac. If the rupture be very large, and ancient, the patient far advanced in life, the intestine not bound by any degree of stricture, but does its office in the scrotum regularly, and no other inconvenience be found to attend it, but what proceeds from its weight, it will in general be better not to attempt reduction, as it will in these circumstances most probably prove fruitless, and the handling of the parts in the attempt, may so bruise and injure them as to do mischief: but this must be understood to be spoken of those only in which there is not the smallest degree of stricture, nor any symptom of obstruction
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in the intestine; such circumstances making reduction necessary at all times, and in every case.

With regard to the contents of a hernia, if it be a portion of omentum only, and has been gradually formed, it seldom occasions any bad symptoms, tho' its weight will sometimes render it very troublesome. But if it be produced suddenly by effort or violence, that is, if a considerable piece of the caul by accident slip down at once, it will sometimes prove painful, and cause very disagreeable complaints; the connection between the omentum, stomach, duodenum, &c. being such, as to render the sudden descent of a large piece of the first sometimes productive of nausea, vomiting, cholick, and all the disagreeable symptoms arising from the derangement of these viscera. When the piece of caul is engaged in such a degree of stricture as to prevent the circulation of blood through it, it will sometimes, by becoming gangrenous, be the occasion of very bad symptoms, and even of death, as I have more than once seen; and thus, as a mere omental hernia, it may sometimes be subject to great hazard. But even tho' it should

never be liable to the just-mentioned evil, that is, tho' the portion of the caul should remain uninjured in the scrotum, yet it renders the patient constantly liable to hazard from another quarter; it makes it every moment possible for a piece of intestine to slip into the same sac, and thereby add to the case all the trouble and all the danger arising from an intestinal rupture. It is by no means an uncommon thing for a piece of gut to be added to a rupture, which had for many years been merely omental, and for that piece to be strangulated, and require immediate help.

An old omental hernia is often rendered not reducible, more by an alteration made in the state of the prolapsed piece of caul, than by its quantity. It is very common for that part of the omentum which passes thro' the neck of the sac to be compressed into a hard, smooth body, and lose all appearance of caul, while what is below in the scrotum is loose and expanded, and enjoys its natural texture: in this case reduction is often impossible, from the mere figure of the part; and I have so often seen this, both in the living and the dead,
that

that I am satisfied that for one omental rupture rendered irreducible by adhesions, many more become so from the cause abovementioned.

In the sac of old omental ruptures that have been long down, and only suspended by a bag truss, it is no very uncommon thing to have a pretty considerable quantity of fluid collected; this in different states and circumstances of the disease is of different color, and consistence, and seldom so much in quantity as to occasion any particular attention to it; but, on the other hand, it sometimes is so much in quantity as to become an additional disease to the original one: I have more than once been obliged to let it out, in order to remove the inconvenience arising from its weight, and the distention of the scrotum, which I have also seen become gangrenous by the neglect of this operation.

If the hernia be of the intestinal kind, merely, and the portion of gut be small, the risque is greater, strangulation being more likely to happen in this case, and more productive of mischief, when it has happened; for the smaller the portion of gut is which is engaged, the tighter the tendon

tendon binds, and the more hazardous is the consequence. I have seen a fatal gangrene, in a bubonocoele, which had not been formed forty-eight hours, and in which the piece of intestine was little more than half an inch. There are few practitioners who have seen business, but know the truth of this; but perhaps the reason of it is not sufficiently explained to the unknowing: it is this; when a considerable portion of intestine passes out from the belly in a hernial sac, it necessarily and unavoidably carries with it a proportional quantity of the mesentery, which every body knows is a strong double membrane. When the prolapsed part is at all considerable, this double membrane is again in some measure folded on itself, and takes off a good deal of the effect of the stricture on the intestine. Now altho' this circumstance will not prevent the effect, if the means of relief be totally neglected, yet it will most certainly retard the evil, and give more time for assistance; whereas, when there is little or none of the mesentery gets thro' the tendon, and the thin, tender intestine bears all the force of the stricture,

stricture, it is immediately brought into hazard.

The practical inference to be drawn from hence is too obvious to need mentioning.

In the intestinal, as in the omental hernia, they which have been often or long down, are in general more easily returned, and do not require such immediate assistance, as they which have seldom been down, or have recently descended, and in the one kind of hernia as well as in the other, the state of the hernial sac with regard to size, thickness, &c. depends very much on the date of the disease, and the regard that has been paid to it.

If the hernia be caused by a portion of the intestine ileum only, it is in general more easily reducible than if a part of the colon has descended with it, which will also require more address and more patience in the attempt. The reduction of a mere intestinal hernia too (*cæteris paribus*) will always remain more practicable than that of a mere omental one, after it has attained to a certain size and state, as the part contained within the former is liable to less alteration of form than that within
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the latter, which alteration has already been mentioned as no infrequent hindrance of the return of an old caul rupture.

Not that the parts within a mere intestinal hernia are absolutely exempt from such an alteration, as may render their return into the belly absolutely impracticable even where there is no stricture; for I have seen that part of the mesentery, which has lain long in the neck of the sac of an old rupture, so considerably hardened and thickened, as to prove an insuperable obstacle to its reduction.

Upon the whole, every thing considered, I think it may be said, that an intestinal rupture is subject to worse symptoms, and a greater degree of hazard than an omental one, tho' the latter is by no means so absolutely void of either as it is commonly supposed to be. That bad symptoms are more likely to attend a recent rupture than one of ancient date: that the descent of a very small piece of intestine is more hazardous than that of a larger: that the hernia which consists of gut only is in general attended with worse circumstances than that which is made up both of gut and

and caul: and that no true judgment can be formed of any rupture at all, unless every circumstance relating to it be taken into consideration.

THE cure of a rupture is either perfect, (called also radical) or imperfect, which is called palliative.

This distinction, which is just and true, and founded both on reason and experience, has frequently been misunderstood by the generality of mankind, and has therefore been the cause of much undeserved censure on the practitioners of surgery.

The truth is, that tho' the events are extremely different, yet the chirurgical means which are made use of in either case are exactly the same, viz. reduction of the protruded parts, and retention of them when so reduced by proper bandage; these sometimes, and in some circumstances produce a perfect cure, at other times, and under other circumstances, prove only a palliative one; and this uncertainty of event, being dependent on causes, which a surgeon can neither foresee nor direct with any tolerable degree of certainty, should

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warn him against being too forward in making a promise.

To those who are ignorant of the anatomical structure and disposition of the parts concerned in the disease, this assertion has the air of a paradox; they naturally suppose that the means which are or should be made use of to obtain a radical or perfect cure, are or ought to be different from those used toward obtaining only a palliative one, and in this mistake they are confirmed by the bold, tho' false, assertions of all rapture quacks.

To labour under a troublesome disorder, perhaps in the most joyous and active part of life, is very disagreeable; to be told that a palliative cure, by the constant use of a truss, is all that can reasonably be expected, gives small comfort, and renders the insinuation, that the regular professors of surgery do not understand the proper treatment of this disease, credible, or at least makes it be believed; *quod volumus, facile credimus*. Ignorance of the true nature of the disorder, with a strong desire to be well, on the side of the patient, and bold plausible promises on the side of the pretender, encourage the delusion, 'till time,
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and the continuance of the rupture, prove the fraud, which few are found ingenuous enough to own. Whether it proceeds from a false bashfulness which makes a man be ashamed of acknowledging that he has been imposed upon; or from a desire merely to conceal the disorder; from a pleasure arising from seeing others deceived as well as themselves; or from a much worse cause than either of these, I know not; but it happens not very infrequently that the patient, tho' perfectly undeceived, and convinced of the imposition, concurs in propagating the delusion, and asserts that he has received a cure, which he knows he has not: of this I could produce many instances, and some of those among people of such rank, as one would expect should set them above such dissingenuousness.

I have already said, that to replace the prolapsed body, or bodies, within the cavity of the belly, and to prevent their falling out again, by means of a proper bandage, is all that the art of surgery is capable of doing in this disease; and what I said was strictly true: but it must also be remembered, that nature, according to the age of the patient, the date of the disease, the

the kind of rupture, and some other circumstances, is often capable (when properly assisted, and not obstructed) of doing more, and of confirming that as a perfect cure in some, which in others she leaves imperfect, and constantly requiring the assistance of art; for when the portion of gut or caul, or whatever formed the tumor, is perfectly and properly replaced in the belly, and an opportunity thereby given to the aperture in the tendon to contract itself, and for a proper bandage to bring the sides of the entrance of the hernial sac as near together as it will admit, the surgeon has really done his part, what remains is that of nature, and whether she will be capable of so contracting the part, as to prevent a future descent or not, is matter of great uncertainty; it is a circumstance which art has very little power of assisting, and which can be known only from the event.

On the contrary, all the pretensions which have at different times been made to remedies, indued with a capacity of healing and consolidating, the parts supposed to be broken or torn, or of constring-
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ing such as are dilated, have all proved inefficacious and delusive, to say the best of them; the parts concerned in this disease, and which ought to be affected by the operation of such remedies, are absolutely out of the reach of any applications or medicines whatever; the relief which some people have found while under such processes, has been from the long rest which they have been subjected to, or from the strict bandage which has been put upon them, either of which will in some cases do a great deal; while the remedies which are either applied or taken, are made use of merely to deceive, and never had, or can have, any share in the real cure of a rupture.

By what has been said, I must beg not to be understood to mean that when the gut or caul have been once replaced, the patient can receive no farther benefit from chirurgical assistance; nor that every rupture in persons of mature age is incapable of perfect cure; this is far from my meaning, and far from truth. There are many circumstances attending ruptures, which will require frequent assistance, in

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order to render a cure moré probable, and there are many ruptures in persons of mature age, which will admit of perfect cure if properly and judiciously managed from the first.

I only mean to contradict that positive assertion which all rupture quacks make use of, and which too many of mankind believe, viz. that there are medicines and applications which are specific in the cure of this disease, and that they are possessed of such; both of which are absolutely false.

As this is a matter of some importance to mankind, and may possibly be rendered still more intelligible by a few words, I beg leave to be indulged in them.

The general doctrine is, that the ruptures of infants, and of very young children, frequently admit of a perfect cure; those of adults less frequently; and those of old people seldom or never; all which, with certain limitations, is true.

The great and material difference between these, consists in the state of the hernial sac, and that of the aperture in the abdominal tendon thro' which it passes.

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The sac of a hernia has already been described as being an elongation or process of the peritoneum, or general lining of the cavity of the belly, thrust down before the body constituting the swelling, which body is enveloped in it as in a bag; somewhat resembling what is vulgarly called a thumb-stall, or the finger of a glove cut off. While the hernia is recent, this bag is thin and fine, like the rest of the membrane of which it is a portion; and being of a very dilatable nature, is easily enlarged according to the quantity of contents which insinuate themselves into it. Like some other parts of the body, it increases in thickness and toughness as it increases in capacity; and as it seldom, if ever, returns back into the belly after it has once passed out from it, it is by the repeated descents of a portion of gut, or caul, into it, gradually enlarged in size, and consequently in thickness; insomuch that in old ruptures which have been neglected, or deemed irreducible, or been suffered to remain long, or always down, it generally acquires a very considerable degree of toughness, thickness, and hardness. In those ruptures which are not of the congenial kind, at

first it gets no lower than the groin, and while it remains there is generally small and thin, but by frequent protrusions of the intestine or omentum, it is pushed by degrees into the scrotum, and then most frequently acquires a pyriform kind of figure, having its broader part in the scrotum, and its narrow one, or neck, in the groin.

In infants, in very young subjects, and in recent cases, this sac, from its soft, thin state, is capable of having its upper part, or neck, so compressed by means of a bandage, as either to procure a union of the sides with each other, or at least so to lessen the diameter of its passage as to prevent the descent of any thing into it from the belly; this produces what is commonly called a perfect cure.

In those of mature age, or whose ruptures are of some standing, the entrance into the sac is generally large, in proportion to the size and age of the patient; and thicker and firmer than in the former state, for reasons just given; in these, therefore, the closing or compression of its neck, enough to hinder the falling down of any thing from the abdomen, is more difficult

difficult to accomplish, and more unlikely to succeed. In very ancient people, or very old ruptures, success is still more improbable, for the same reasons.

A bandage therefore, or truss, tho' it is the only remedy, at all ages, and in all states, of reducible ruptures, yet acts in a different manner, and is capable of producing very different effects, according to the circumstances of the cases in which it is applied: in very young persons, a radical cure is frequently the consequence; in the middle-aged, it often gives the tendon and mouth of the sac such opportunity of being contracted, as to produce nearly the same event; but as it only serves by the mere pressure of the pad to keep the parts in their proper place, in very old people it can hardly ever be laid aside, without hazard of a new descent, which while it is worn properly, it will almost always prevent.

From the foregoing short account, the following facts may, I think, be collected.

1. That the principal circumstances attending a rupture must be subject to great variety, according to the age and constitu-

tion of the patient, the date of the disease, &c. and consequently that the precise case, and age, in which a radical or perfect cure is obtainable or not, is not easy to be determined, tho' a judicious man will most commonly know when it is very improbable.

2. That recent ruptures, if immediately and properly taken care of, are capable of a perfect cure, at almost any age.

3. ~~That~~ tho' the thickness of the hernial sac, and the largeness of the abdominal aperture, are generally mentioned as the two causes why old ruptures do not admit of a cure, yet in fact the latter is only a consequence of the former.

4. That all external applications in the attempt toward the cure of a rupture, must, if they are used with any design at all, be intended either to constringe the aperture thro' which the parts have descended, or to lessen or contract the diameter of the neck of the hernial sac.

5. That the constriction of the tendinous aperture (supposing such medicines could penetrate to it) is impossible, while it continues dilated, by an old, thick, tough
hernial

hernial sac, which sac, from the connexions it always has with the cellular membrane of the spermatic chord, can never be returned into the belly; and therefore,

6. That such medicines can be serviceable no other way than by rendering that sac again thin, fine, and compressible; which from the nature of things, and from all experience, is absolutely impracticable.

S E C T I O N II.

THE different treatment which ruptures may require being dependant on different circumstances attending the disease, I shall for the better information of the inexperienced reader divide them into four classes, under which, I think, may be comprehended not only all the kinds of hernias, but every particularity also with which they may happen to be distinguished.

1. Under the first I reckon those which are capable of easy and immediate reduction, and are not attended by any troublesome or bad symptoms.

2. Under the second those which have been so long down, that the contained parts

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are either so altered in form, or have contracted such adhesions and connections, as to be absolutely incapable of being reduced at all.

3. Under the third I comprehend those in which such stricture has been made on the protruded parts, as to bring on pain, and produce such an obstruction in the intestinal canal, as to render immediate reduction necessary, but at the same time difficult.

4. And under the fourth I shall place those in which the return of the parts by the mere hand is absolutely impracticable, and in which the patient's life can be saved only by a chirurgical operation.

The first is very frequently met with in infants, and sometimes in adults, and is too often neglected in both. In the former, as the descent seldom happens but when the infant strains to cry, and the gut is either easily put up, or returns, sua sponte, as soon as the child becomes quiet, it often is either totally unattended to, or an attempt made to restrain it only by a bandage made of cloth or dimity, and which being ineffectual for such purpose,
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lays the foundation of future trouble and mischief.

This is in great measure owing to a common opinion that a young infant cannot wear a steel truss; a generally prevailing error, and which ought to be corrected. There is no age at which such truss may not be worn, or ought not to be applied; it is, when well made, and properly put on, not only perfectly safe and easy, but the only kind of bandage that can be depended upon; and as a radical cure depends greatly on the thinness of the hernial sac, and its being capable of being so compressed as possibly to unite, and thereby intirely close the passage from the belly, it must therefore appear to every one who will give himself the trouble of thinking on the subject, that the fewer times the parts have made a descent, and the smaller and finer the elongation of the peritoneum is, the greater the probability of such cure must be.

The same method of acting must for the same reasons be good in every age in which a radical cure may reasonably be expected; that is, the prolapsed parts cannot be too soon returned, nor too carefully pre-

prevented from falling down again, every new descent rendering a cure both more distant and more uncertain.

As soon as the parts are returned, the truss should be immediately put on, and worn without remission, care being taken, especially if the patient be an infant, to keep the parts on which it presses constantly washed, to prevent galling.

It can hardly be necessary to say, that the surgeon should be careful to see that the truss fits, as his success and reputation depend upon such care. A truss which does not press enough is worse than none at all, as it occasions loss of time, and deceives the patient or his friends; and one which presses too much, or on an improper part, gives pain and trouble, by producing an inflammation and swelling of the spermatic chord, and sometimes of the testicle.

In adults, whose ruptures are of long standing, and accustomed to frequent ascent and descent, the hernial sac is generally firm and thick, and the aperture in the tendon of the abdominal muscle large, the freedom and ease with which the parts return into the belly, when the patient is in

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a supine posture, and the little pain which attends a rupture of this kind, often render the persons who labour under it careless; but all such should be informed, that they are in constant danger of such alteration in their complaint, as may put them into great hazard, and perhaps destroy them. The passage from the belly being open, the quantity of intestine in the hernial sac is always liable to be increased, and when down, to be bound by a stricture. An inflammation of that portion of the gut which is down, or such obstruction in it as may distend and enlarge it, may at all times produce such complaints as may put the life of the patient into imminent danger, and therefore, notwithstanding this kind of hernia may have been borne for a great length of time, without having proved either troublesome or hazardous, yet as it is always possible to become so, and that very suddenly, it can never be prudent or safe to neglect it.

Even tho' the rupture should be of the omental kind, (which considered abstractedly is not subject to that degree or kind of danger to which the intestinal is liable) yet it may be secondarily, or by accident, the

the cause of all the same mischief; for while it keeps the mouth of the hernial sac open, it renders the descent of a piece of intestine always possible, and consequently always likely to produce the mischief which may proceed from thence.

They who labour under a hernia thus circumstanced, that is, whose ruptures have been generally down, while they have been in an erect posture, and which have either gone up of themselves, or have been easily put up in a supine one, should be particularly careful to have their truss well made, and properly fitted; for the mouth of the sac, and the opening in the tendon being both large and lax, and the parts having been used to descend thro' them, if the pad of the truss be not placed right, and there be not a due degree of elasticity in the spring, a piece of intestine will in some postures slip down behind it, and render the truss productive of that very kind of mischief which it ought to prevent.

It is scarcely credible how very small an opening will serve for a portion of gut or caul to insinuate themselves into at some times. Now, tho' in persons of mature age it most frequently proves impracticable
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so to compress the mouth of the hernial sac, as absolutely to close it, yet by the constant use of a well made truss, it may be so lessened, as to render the descent of a piece of intestine into it much more difficult, from whence we may learn the great consequence of having the part completely reduced before the truss is applied, and the danger that may be incurred by laying such bandage aside after it has been worn any time, since the same alteration which renders the descent of the gut less easy, will also make the reduction more difficult; if a piece should happen to get down; and hence also we may learn why the bandage should be long and unremittingly worn by all those whose time of life makes the expectations of a perfect cure reasonable; many of the ruptures of adults being owing to the negligent manner in which children at school are suffered to wear their trusses.

I know a gentleman who has for some years had an omental rupture, which was neglected while he was young, and he having naturally a lax habit, and the abdominal opening being much dilated, he finds it extremely difficult to keep it up,
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even with the best trufs he can get, behind which it will sometimes flip down : when this happens, it gives him fuch immediate and acute pain at his ftomach, and makes him fo intolerably fick, that he is obliged immediately to throw himfelf on his back, and procure the return of the piece of omentum.

S E C T I O N III.

IN the fecond clafs I ranked thofe cafes in which the parts conftituting the hernia are found irreducible, but not in a ftate of inflammation, nor producing any troublefome or dangerous kind of fymptoms.

This incapacity of reduction may be owing to feveral caufes, but moft frequently arifes either from the largenefs of the quantity of the contents; from an alteration made in their form and texture; or from connections and adhesions which they have contracted with each other, or with their containing bag.

I have already mentioned it as my opinion, that ruptures are fometimes rendered difficult

difficult to be reduced by that portion of the intestinal canal which is called the cœcum, or the beginning of the colon, being contained in the hernial sac. Of which fact I am as much convinced as the nature of such kind of things will permit; that is, by observations made both on the living and the dead.

When a hernia of this kind (viz. one containing such a part of the intestinal tube) has been long neglected, and suffered to remain in the scrotum without any bandage at all to support its weight, the hernial sac being constantly dragged down, and kept in a state of distention, necessarily becomes thick, hard, and tough; by this means the diameter of its neck is lessened, and the return of the intestine back from the scrotum into the belly rendered more and more difficult, as the parts thro' which it is to pass become harder, and less capable of yielding. This will, indeed, in time prove an obstruction sufficient to hinder any part of the intestine, or even the omentum, from being returned; but the more the difficulty is, which proceeds from the mere figure and size of the portion of gut, the greater will be the obstruction
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when added to that arising from the just mentioned cause.

An alteration produced by time, and constant, tho' gentle, pressure in the form; and consistence, or texture of the omentum, is also no infrequent cause, why neglected omental ruptures become irreducible.

The cellular membrane in all parts of the body, however loose and light its natural texture may be, is capable of becoming hard, firm, and compact, by constant pressure. Of this there are so many, and so well known instances, that it is quite unnecessary to produce any.

The omentum, from its texture, is liable to the same consequence. When a portion of it has been suffered to remain for a great length of time in the scrotum, without having ever been returned into the belly, it often happens that although that part of it which is in the lower part of the hernial sac preserves its natural soft, adipose, expansile state, yet all that part which passes thro' what is called the neck of the sac, is, by constant pressure, formed into a hard, firm, incompressible, carious kind of body, incapable of being expanded, and taking the form of the passage in
which

which it is confined, exactly filling the passage, and rendering it impossible to push up the loose part which fills the scrotum.

This is no theoretic opinion, but a fact, which I have seen and proved often; and whoever will reflect on it, will immediately see in it one insuperable objection to the return of some old omental ruptures.

The same reason for incapacity of reduction, is also sometimes met with in ruptures of the intestinal kind, from an alteration produced on that part of the mesentery which has been suffered to lie quiet for a great length of time in the neck of an old hernial sac.

The other impediment, which I mentioned, to the return of old ruptures, is connection and adhesion of the parts, either with each other, or with the bag containing them. This is common to both the intestinal and omental hernia, and is produced by slight inflammations of the parts, which have been permitted to lie long in contact with each other, or perhaps in many cases from the mere contact only. These adhesions are more or less firm in different cases, but even the slightest will almost always be found an invinci-

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ble objection to the reduction of the adherent parts, by the hand only.

Many, or perhaps most of these irreducible ruptures become so by mere time and neglect, and might at first have been returned; but when they are got into this state, they are capable of no relief from surgery but the application of a suspensory bag, to take off or lessen the ^binconvenience arising from the weight of the scrotum.

People in this situation should be particularly careful not to make any attempts beyond their strength, nor aim at feats of agility; they should take care to suspend the loaded scrotum, and to keep it out of the way of all harm from pressure, bruise, &c.

^b I am not unaware that most of these are capable of being cured by the operation for the bubonocoele, as it is called; but as I should never think of proposing it in any case in which there are not symptoms that threaten the life of the patient, so I have not mentioned it in this place as a means of cure. I also am not unapprized what influence a successful operation or two of this sort has had on the unknowing, among both the great vulgar and the small; but I also know that such accidental successes have emboldened the same operators to commit more than one or two murders, in similar cases; and that, from the prevalence of fashion, some of these rupture-doctors have been largely rewarded, when they ought to have been hanged.

&c. When the tumor is very large, a soft quilted bolster should be worn at the bottom of the suspensory to prevent excoriation, and the scrotum should be frequently washed for the same reason; a loss of skin in this part, and in such circumstances, being sometimes of the utmost importance. They ought also to be particularly attentive to the office of the intestinal canal, to see that they do not by any irregularity of diet disorder it, and keep themselves from being costive, for reasons too obvious to need relating. By these means, and with these cautions, many people have passed their lives for many years free from disease, or complaint, with very large irreducible ruptures.

On the other hand, it is fit that mankind should be apprised that the quiet, inoffensive state of this kind of hernia is by no means to be depended upon, many things may happen to it, by which it may be so altered, as to become hazardous, and even fatal; an inflammation of that part of the gut which is down, any obstruction to the passage of the aliment or fæces thro' it, a stricture made by the abdominal tendon, either on what has been long down,

or on a new portion which may at any time be added to it, are always capable of so altering the state of the case, as to put the life of the patient into danger.

Indeed the hazard arising from a stricture made on a piece of intestine contained in the sac of an old irreducible hernia, is in one respect greater than that attending one that has been found at times reducible; since from the nature of the case it will hardly admit of any attempt toward relief, but the operation, and that in these circumstances must necessarily be accompanied with additional difficulty¹.

Among

¹ I was some time ago desired to be present at the opening of the dead body of a man who had for many years laboured under a large irreducible hernia, but which had never given him any other trouble than what proceeded from its weight, and who died very old: my then state of health would not permit me to go, but I desired leave to send a very ingenious young gentleman, Mr. Price, who was then my pupil at St. Bartholomews, and is now settled in Wales. The following is the account he gave me.

“ The hernia was of fourteen years standing, during
 “ which time no attempt had ever been made for its re-
 “ duction; it was on the right side, and distended the
 “ scrotum to such a size, that it measured, from the
 “ opening in the abdominal muscle, to the bottom of the
 “ tumor, fourteen inches and a half, and round the tu-
 “ mor

Among the ruptures which have been thought not reducible, and treated as such, there have been some which upon more judicious and more patient attempts, have been found capable of reduction.

When this is suspected to be the case, the proper method is by absolute rest, in a supine posture, for a considerable length of time, by great abstinence, and the use of evacnants, so to lessen the size of the parts in the hernial sac as to render them capable of passing back again into the belly.

This method has now and then succeeded, and in some cases is worth the trying; but

“ mor twenty-two inches; the ring, as it is called, was
 “ very large, and had no appearance of stricture; the sac
 “ was not so thick as might have been expected, and
 “ contained no water; the jejunum, ileum, the sac of the
 “ colon, called the cœcum, with its appendicula vermi-
 “ formis, together with a large portion of omentum,
 “ were the contents; the duodenum was so displaced by
 “ the weight of the rest of the guts within the sac, that
 “ its direction from the pylorus was perpendicular; the
 “ caul adhered to the hernial sac in several places, the
 “ intestine in none; the testicle, included in its tunica
 “ vaginalis, was much wasted; the spermatic artery and
 “ vein ran down behind the hernial sac, but the vas de-
 “ ferens ran up on the inner and left side of it, at a great
 “ distance from them, thro’ the whole of its course, but
 “ nevertheless would not have been in the way of the
 “ operation had it been necessary.”

but previous to the attempt, there should be some circumstance which makes the success probable, and there should also be good reason to believe that the habit and age of the patient will bear the necessary confinement and evacuation, otherwise, even tho' he should get rid of his rupture, he may be much worsted by the experiment ^k.

If such attempt succeeds, a truss should be immediately put on, and worn constantly, without remission; for in these people, the largeness of the abdominal aperture, the thickness of the hernial sac, and the relaxation of the mesentery, make a new descent always to be apprehended and guarded against.

An omental rupture which has been so long in the scrotum as to have become irreducible, is very seldom attended^l with any bad symptoms, considered abstractedly; but, as I have already said, it is constantly capable of being the occasion of an
intestinal

^k Hildanus gives an account of a man radically cured by six months confinement to bed, in the case of a rupture of twenty years date.

^l Garengot relates the case of an epiplocele producing very bad symptoms; and so does Dionis.

intestinal hernia, and all its consequences; neither is that all, for the omentum, either so altered in form and texture, or so connected, as to be incapable of reduction, may by accident inflame, and either become gangrenous or suppurate, and be the occasion of a great deal of trouble. Of this I have seen two or three instances, one of which I will relate.

I was desired to see a gentleman, from whose scrotum near a pint of brown, sanious, foetid fluid had been discharged two or three days before. The account he gave of himself was as follows; that he had been from his youth subject to the descent of a soft, flabby body into the scrotum, when he was in an erect posture, but which for many years he could put up when he pleased, and which always went up when he lay down; that having no trouble from it, and being naturally shy and bashful, he had done nothing to it, nor ever shewed it to any one; that from the sudden spring of an unruly horse, he had struck it with great violence against the pummel of his saddle, which had given him great immediate pain; that the next day it swelled still more, and became more painful, but

that being afraid, or ashamed, he still concealed it, and only anointed it with something greasy, till at last he could bear it no longer; the person to whom he shewed it took it for a hydrocele, tapped it, and let out the fluid just mentioned, and on the fifth or sixth day from this operation I saw it.

The whole scrotum was much inflamed, and the orifice made by the trocar foul and sloughy; he had a degree of heat and fever upon him, which forbade any operation at that time, and therefore I desired that he might be dressed soft and easy, have an emollient cataplasm applied to the whole scrotum, lose some blood, and have a glyster.

By proper care the tumor subsided, his fever left him, and the slough casting off largely, brought the putrid omentum within view; upon sight of which I would have laid the whole open, but was not permitted; I enlarged the orifice a little, and in so doing, cut through an old hernial sac, which was very thick and hard; what part of the omentum was loose I brought away with a pair of forceps, but the separation of the whole took up much time,

time, and the hard hernial sac caused so many abscesses, and occasioned so large a discharge, that being a valetudinarian, he had certainly sunk under it, had it not been for the free use of the bark.

If, instead of this method of treating it, I had been permitted to have laid it open, thro' the whole of its length, removed the rotten omentum, and cut off some part of the sides of the hernial sac, the cure would have been shortened, and the scrotum would have been left in a much better state.

That an omental rupture, which has so long resisted all attempts for reduction, as to create a belief of its being absolutely irreducible, may now and then, by long rest and abstinence, become capable of being returned, I am under no doubt, for reasons which have already been mentioned; and not long ago, I had myself a patient in St. Bartholomew's hospital, who underwent the operation for the radical cure of a hydrocele, who had also an omental hernia, which I and some others had often tried ineffectually to reduce; this, during the time of his confinement to bed, after the operation, went up of its own accord, and was ever afterwards kept there by a truss.

It

It sometimes happens in old compound ruptures that the piece of intestine is reducible, and that of the omentum is not; in which case we are told, that the portion of intestine should be kept up by a truss, whose pad may be so made, as not to press on the omentum while it restrains the intestine.

I will not deny that this may now and then be practicable, but it is not often so, and it ought to be particularly attended to, and very carefully watched, lest a small piece of gut slip down, and being pressed on by the truss, produce fatal mischief.

I have seen an omental rupture, in which the piece included in the sac had the knotty hardness, the pain, and every other symptom of a cancer.

SECTION IV.

UNDER the third division I reckon those ruptures which are reducible, but whose reduction is difficult, and which are attended with pain and trouble and hazard.

Difficulty

Difficulty of reduction may be owing to several causes. The size of the piece of omentum, or the inflamed state of it; the quantity of intestine and mesentery, an inflammation of the gut, or its distention by fæces or wind; or the smallness of the aperture of the tendon through which the hernia passes. But to whatever cause it be owing, if the prolapsed body cannot be immediately replaced, and the patient suffers pain, or is prevented thereby from going to stool, it is called an incarcerated hernia, a strangulated hernia, or a hernia with stricture.

The symptoms are a swelling in the groin or scrotum resisting the impression of the fingers; if the hernia be of the intestinal kind, it is generally painful to the touch, and the pain is increased by coughing, sneezing, or standing upright: these are the very first symptoms, and if they are not relieved, are soon followed by others, viz. a sickness at the stomach, a frequent reaching, or inclination to vomit, a stoppage of all discharge per anum, attended with a frequent, hard pulse, and some degree of fever.

A pa-

A patient in these circumstances may be looked upon as in some danger, and requiring immediate assistance. A stricture made on the prolapsed part of the gut, by the borders of the natural aperture in the tendon of the oblique muscle, is the immediate cause of these symptoms, which nothing can appease or remove, except what will take off that stricture. The two methods of accomplishing this end are, by removing the part so bound from the tendinous opening; by returning it back into the belly, whence it came; or by dividing a part of the tendon itself: the former of these, when it can be practised, is always most eligible, and makes our present subject.

I have already observed, that a portion of intestine, while it is neither bound by any degree of stricture, nor affected by inflammation, will remain quiet in a hernial sac in the scrotum, and perform its proper office freely and perfectly; but the instant either of the above-mentioned accidents (particularly the former) happens, the case is altered; the passage both of the aliment and fæces is stopped or interrupted; the peristaltic motion of the whole canal is

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disturbed

disturbed or perverted, and the circulation of the blood, thro' the straitened portion of intestine, is so impeded, that if the obstruction be not removed in time, a mortification must follow.

Every symptom which attends an incarcerated rupture depends on this cause, and is justly accountable for from it. The tumor, the pain, the tension of the belly, the nausea, the vomiting, and the suppression of stools, are so many effects produced by this one cause, and removable only by removing it.

My present consideration being those ruptures which are capable of being returned, I am now to speak of the manner of attempting such reduction.

The patient should be laid in a supine posture, with his trunk certainly as low, if not lower than his thighs; the thigh on the diseased side should be so elevated, as to contribute as much as possible to the relaxation of the abdominal aperture, and then the surgeon, grasping the lower part of the tumor gently with his hand in such a manner as to keep the testicle from ascending, and the intestine from descending, must endeavour to procure the return of
the

the latter thro' the ring, as it is vulgarly called, by gentle continued pressure toward that opening. If the case be a bubonocoele, there will be no occasion for endeavouring to grasp the tumor, but by continued, moderate pressure on it with the fingers, to endeavour the return of the piece of gut.

This may serve for a general description of the method of performing this operation; but the exact manner of executing it is one of those manœuvres which can be learnt only by observation and practice, and of which no verbal description can convey an adequate and perfect idea: knowledge of the structure, and situation of the parts, will instruct any one how to go about it, and a little practice will soon make him adroit.

The posture of the body, and the disposition of the lower limbs, may be made very assistant in this operation, when the difficulty is considerable; the nearer the posture approaches to what is commonly called standing on the head the better, as it causes the whole packet of small intestines to hang, as it were, by the strangulated portion, and may thereby disengage it.

it. A little time and pains spent in this manner will frequently be attended with success, and obtain a return of the part; but if it should not, and the handling of it (which, I must repeat, should always be gentle) becomes painful, and very fatiguing to the patient, we are advised to desist a few hours, and try the effect of other means.

These means are phlebotomy, glysters, cathartics, the application of cataplasms, fomentations, embrocations, &c.

Children, especially very young ones, bear the loss of blood very ill, and are very apt to swoon, if the quantity be at all considerable; if therefore such accident happens, the surgeon should embrace the opportunity which such general relaxation will afford him of reducing the rupture, especially as it gives him another advantage by preventing the child from crying, and making resistance.

Perhaps there is no disease affecting the human body in which bleeding is found more eminently and immediately serviceable than in this, and which therefore, if there are no particular circumstances in the constitution prohibiting it, ought never to be

be omitted; but, on the contrary, should be freely and largely repeated, if it appears at all necessary.

A semicupium, or warm bath, will, by the general relaxation which it necessarily produces, be found frequently serviceable.

The use of warm fomentations, soft cataplasms, and relaxing oily embrocations, are also advised, with a view to relax the tendon of the abdominal muscle, and to render the return of the parts contained in the hernial sac easy; but I am afraid that such kind of applications have in general been the occasion of much more mischief than good. The effect of them can hardly reach beyond the skin and membrana cellularis, and may possibly, by relaxing them, take off some small part of the pain which arises from their distention, but will seldom have any effect on the immediate seat of the disease, the tendon of the oblique muscle; the enlargement or relaxation of which only can be of material service.

I know that in this I differ from the majority both of writers and practitioners, but having (as I think) truth on my side, I do again venture to say, that I verily believe, that the confidence which has been placed

placed in such kind of applications has destroyed many more lives than it has saved. A hernia, with painful stricture, and stoppage of stools, is one of those cases, in which we can seldom stand still, even for a short space of time; if we do not get forward, we generally go backward; and whatever does no good, if it be at all depended upon, certainly does harm, by occasioning an irretrievable loss of time: of this kind I take the cataplasm and embrocation^m to be; while the former is applied, or the latter used, no other more powerful means are made use of; and though it has all the appearance of doing something, yet I fear it is little more than specious trifling; especially if the case be at all pressing.

Very different have been the opinions of different people concerning the use of cathartic medicines; some advising them strenuously, others making no dependance
on

^m In a very pompous modern book may be seen an operose, expensive process, for making an ointment, of a solution of gold; pearl, &c. to be used for assisting the reduction of strangulated intestines; and which, when properly made, may possibly be as useful as pomatum, ointment of elder, or any other greasy application.

on them at all. As different also have been the opinions of those who do advise them with regard to the kind of medicine proper on this occasion; some prescribing those of the lenient kind, such as Glauber's salt, infusum fenæ, &c. others the more powerful or ponderous kind of remedies, such as Extract. Cathart. Jallap, Mercurius Dulcisⁿ, &c.

I believe I may venture to say that I have tried them all, but I cannot say that I have such faith in any of them as to think very highly of them. With regard to the former, viz. the lenient sort of purges, it is not often that a patient in these circumstances can keep them upon his stomach; and even when they are not rejected by vomit, they very seldom have force sufficient to answer the end proposed. The more stimulating ones are certainly better calculated to excite the peristaltic motion of the intestines (the one thing to be aimed at) and

ⁿ The ingenious and learned Dr. Monro of Edinburgh, says, that he has more than once reduced a rupture of this kind by a smart doze of jallap and mercurius dulcis, when other methods have failed. The same gentleman says he has seen the external application of cold claret, or snow, instead of a warm poultice, used with good success.

and thereby free the confined piece; but, on the other hand, if they do not succeed, they add to the fullness and tension of the belly, as well as to the heat and thirst.

I would by no means be understood to mean that I am absolutely against the use of cathartic medicines; I only mean to signify, that I have no great dependance on them, and that I think persisting in the ineffectual use of them often adds unnecessarily to the suffering of the patient.

But tho' I cannot say that I have seen frequent benefit from the exhibition of cathartics by the mouth, yet I have often experienced the good arising from acrid, stimulating glysters, and suppositories frequently repeated*; particularly from the smoke of tobacco, and from a composition of salt, honey, and aloes, boiled to the proper consistence of a suppository. By these I have seen very alarming ruptures returned, when they have been thought capable of being relieved by nothing but the surgical operation.

There

* I cannot help thinking that the present machine, which is used for the tobacco glyster, might be considerably improved, that is, might be made to throw in the same in much greater quantity, and with more certainty.

There is another method of endeavouring to obtain relief in this case, which has been proposed by few, and I hope practised by fewer (though I have seen two patients upon whom it had been tried, and who were both destroyed by it). It is the making several punctures with a round needle through the tumid scrotum into the gut, in order (as it is said) to let out the air which is supposed to distend the latter, and prevent its return; if this practice was worth a serious refutation, many arguments, drawn from the nature both of the parts and of the disease, might be produced against it; but it is really too absurd to waste either my own or the reader's time about it.

There is no circumstance attending ruptures with stricture, in which more variety is found, than in the time which they will safely admit to be spent in their reduction; some have been successfully replaced at the end of eight or ten days, others have proved fatal in one. This difference may proceed from difference of constitution and habit, or from some particular circumstance in the disease itself; but let the cause of it be what it may, as it never can be absolutely

lutely foreseen, it should never be trusted; the sooner a rupture is reduced, the sooner the patient is out of danger from the stricture, and the sooner will he be rid of those symptoms, which it has already occasioned.

Recent hernias are in general more liable to stricture than old ones, for reasons which are obvious from what has already been said; but when old ones get into the same circumstances, the symptoms are much the same; tho' I think in general they are not altogether so pressing, and the latter generally admit of more time to attempt reduction in. The smaller the portion of intestine is which is engaged, the greater the pain is, and the more hastily do the symptoms advance. I have seen a bubonocoele in a young woman prove fatal in less than a day, which had never been down before, and in which the portion of intestine was so small, as hardly to engage its whole canal.

Omental ruptures in general are not subject to bad symptoms arising from stricture, tho' they will sometimes be painful, and troublesome, from the connexion of the caul with the viscera, as I have often

seen. As this is an accident which they are all liable to, they should never be suffered to remain down, if they are reducible, and that not only on this account, but also because they render the patient always liable to the descent of a piece of gut. In general they are more easy of reduction than the intestinal, and being not painful will admit of more free handling, as well as more time to be spent in the attempt^p.

I have already mentioned the reasons why an omental rupture is sometimes incapable of being reduced, viz. adhesion to the sides of the hernial sac, or such an alteration in the form of it, as makes it impossible for it to pass thro' the abdominal aperture. When this is truly the case, as is most reasonable to suppose, when it resists all proper attempts, there is no remedy but to suspend the weight of it in a bag-truss, and thereby render it as little troublesome as possible. This is indeed all that can be done when the rupture is absolutely

^p Writers of good credit have given accounts of the worst symptoms from a mere epiplocele; in Dionis may be seen a case of this kind, in Garengot, and others.

solutely irreducible; but in books will be found direction to leave an old omental hernia down, and suspend it in a bag, even tho' it should be reducible, rather than return it into the belly, lest it should lie there in a lump, and make the patient uneasy. This is one of those maxims which writers receive from each other, and deliver down to posterity, without inquiring into their propriety. It may in some few particular cases be right to do so, but cannot be admitted as a general rule; surely it must always be worth while to try how it will be when it is up, rather than be content with a method, which is hardly palliative, and which always may be productive of new evil.

When the parts are fairly reduced, the next consideration is how to keep them from falling down again; this can only be done by a bandage, the pad of which must make a constant pressure against the opening in the abdominal tendon, and thereby not only keep the gut, or caul, from pushing out, but make the sides of the hernial sac approach each other as near as possible.

In the making and adjusting this kind of bandage, some ingenuity is necessary; if it be not so made, and so put on, as to do good, it will do harm; if it does not keep the intestine up, the patient is much more liable to mischief with it than without it, and it has often, by pressing on the rupture while down, proved very pernicious in cases where there has been no degree of stricture from the tendon: it therefore behoves every surgeon to see that the truss which he orders is well made, and properly applied, lest all his pains should be baffled by the bad make, or injudicious application of this piece of machinery.

If the symptoms of pain, inflammation, &c. ran high before the parts were reduced, they will not always cease immediately after; and as the symptoms which remain after the gut is returned, do in all probability proceed from its having been inflamed by the stricture, such remedies as are proper in that case ought to be made use of; the body should be kept open, and the diet and regimen should be low and sparing, while the least degree of tension or pain remain; in short, till all complaint
is

is absolutely removed from the abdomen, and the intestines do their office freely, and without trouble.

SECTION V.

I AM now come to the fourth division, under which I comprehended all those ruptures, which are in such a state as to be irreducible by the mere hand, and in which a chirurgical operation is necessary for the preservation of the life of the patient.

Impracticability of reduction may be owing to many causes, most of which have already been recited; such are, alteration of the form of the parts contained in the hernial sac, largeness of their quantity, adhesions either to the sac, or to each other, or both, and a stricture made on the intestine, by the borders of the aperture in the abdominal tendon: these are each of them causes why ruptures are sometimes incapable of being returned back into the belly, and will require our consideration in their proper places; but in this it is my intention to speak only of the last, it being
that

that which calls most immediately for relief, and which most frequently requires the surgeon's knife.

Whether the primary and original cause of the mischief arising from this stricture, is in the contained, or the containing parts of a rupture, I will not now stay to inquire; nor whether the stricture made by the tendon be a cause, or an effect; but shall consider the intestine as so engaged in it, as to be rendered incapable of being returned into the cavity of the belly (by the hand only) and suffering in such manner, by being so bound, as to produce a series of bad symptoms, and at last, (if not relieved) death.

This stricture, which according to its different degrees renders the reduction of an intestinal hernia either difficult or impossible, is according to such degrees productive of what are called the symptoms of a strangulated rupture, and which are more or less pressing, as they more or less interest the life of the patient.

The earliest of these symptoms were related in the former section, as attendant on those ruptures which were reducible, tho' with

with difficulty, viz. tumor in the groin, or scrotum, attended with pain, not only in the part, but all over the belly, and creating a sickness and inclination to vomit, suppression of stools, and some degree of fever: these are the first symptoms, and if they are not appeased by the return of the intestine, that is, if the attempts made for this purpose do not succeed, they are soon exasperated; the sickness becomes more troublesome, the vomiting more frequent, the pain more intense, the tension of the belly greater, the fever higher, and a general restlessness comes on, which is very terrible to bear. When this is the state of the patient, no time is to be lost, a very little delay is now of the utmost consequence, and if the one single remedy which the disease is now capable of, be not administered immediately, it will generally baffle every other attempt. This remedy is the operation, whereby the parts engaged in the stricture may be set free. If this be not now performed, the vomiting is soon exchanged for a convulsive hic-cough, and a frequent gulping up of bilious matter; the tension of the belly, the restlessness, and fever, having been considerably

derably increased for a few hours, the patient suddenly becomes perfectly easy, the belly subsides, the pulse from having been hard, full, and frequent, becomes low, languid, and generally interrupted; and the skin, especially that of the limbs, cold and moist; the eyes have now a languor and a glassiness, a lack-lustre not easy to be described; the tumor of the part disappears, and the skin covering it sometimes changes its natural colour for a livid hue; but whether it keeps or loses its colour, it has an emphysematous feel, a crepitus to the touch, which will easily be conceived by all who have attended to it, but is not so easy to convey an idea of by words: this crepitus is the too sure indicator of gangrenous mischief within. In this state, the gut either goes up spontaneously, or is returned with the smallest degree of pressure, a discharge is made by stool, and the patient is generally much pleased at the ease he finds; but this pleasure is of short duration, for the hiccough and the cold sweats continuing and increasing, with the addition of spasmodic rigors and subfultus tendinum, the tragedy soon finishes.

These

These are the symptoms of an *incarcerated hernia*, this their general progress, and their too frequent event. The first class of them imply some degree of hazard, but are often capable of being relieved, without the use of the knife; the latter frequently require it, and very often prove fatal by the neglect, or late application of it.

Perhaps there is not in the practice of surgery a point which requires more judgment, firmness, or delicacy, than to determine the precise time, beyond which this operation should not be deferred, and for a surgeon to conduct himself so as to induce a patient to submit to it early enough for his preservation. The time in which a piece of gut will become gangrenous from stricture, or get into a state approaching to that of a gangrene, is extremely uncertain, and depends on circumstances which no man can foresee. There have been several instances of ruptures, attended by pressing symptoms of stricture, which have been safely returned, by the hand only, at the end of several days; or the operation having been performed at the
same

same distance of time, the parts have been found sound and unhurt ; on the other hand, there are many instances producible, of the intestine having been with great difficulty replaced, or of its returning, spontaneously, from being mortified, or (the operation having been submitted to) of its having been found in such state by the operator, at the end of not many hours.

I have myself seen a small portion of the intestine become perfectly gangrenous, in one day and night from its first expulsion.

The directions which are given to us by writers, are not to be trusted without much circumspection ; the signs or marks, which they in general regard as proofs of the proper time for operating, are most frequently proofs that that time is just elapsed, and that instead of waiting for the arrival of such symptoms, we should have prevented them. On the other hand, to propose an operation of so much consequence before it shall be thought absolutely necessary, may admit of such misconstruction, as no man would wish to have put upon his conduct. Indeed I do not know any situation,

situation, in which a judicious and prudent man can be put, in which it will behove him to be more wary and circumspect, more delicate, or more firm.

The two principal circumstances, which have most contributed to the infrequency of performing this operation, are, a dread of great hazard from the operation itself, considered abstractedly, and a fear of bringing a disgrace upon it, by having performed it too late, *ne occidisse, nisi servasset, videretur*^p. The first of these is vastly greater than it ought to be, and is most frequently the cause of the latter; so that if the one can justly be lessened, the other will not be so likely to happen.

That the operation considered simply is not void of hazard, every man who knows any thing of the nature of wounds in membranous and tendinous parts, must acknowledge; they are certainly subject to fever and inflammation, are difficult and slow of digestion, and in some particular habits are apt to become gangrenous; but that they are necessarily, or even most frequently hazardous, daily and manifold experience contradicts.

One

^p Celsus.

One evil is frequently the parent of others. By being afraid of incurring that degree of hazard which is thought to attend the operation merely, the generality of people neither attend to, nor embrace the most proper time for the safe performance of it; or that in which its danger must be necessarily least, because least combined with that which may arise from the state of the parts within; a state even at first not absolutely safe, but which all delay beyond a certain time must hourly increase the hazard of.

If I might presume to give my opinion on this subject, I should say that the operation ought always to be performed as soon as possible after it appears, that all rational attempts, by large and free bleeding, the warm-bath, glysters, &c. are found to be ineffectual, or that the symptoms rather increase than decrease, while such means are made use of, and that the handling necessary for reduction becomes
more

* Perhaps I may be thought somewhat singular, but from what I have seen I am much inclined to believe, that when the parts are very painful to the touch, and the

more and more painful; for if it be delayed until the inflammation has attained a certain height, tho' the parts upon being laid open, are not found quite gangrenous, that is no proof that the want of success must be set to the account of the operation merely. That state of inflammation, either of the intestine, or of the hernial sac, which is just not gangrenous, is no state of safety,

scrotum large, and much upon the stress, more harm is generally done by the manual attempts for reduction than good. In this state, the great distention of the intestine renders it very incompressible, and very little likely to be returned thro' the tendinous aperture by mere force, (for such it is, in whatever degree it be used) and either a brisk irritating purge, or a very stimulating glyster, (particularly the tobacco-smoke) are more likely, by exciting the peristaltic motion, to disentangle it, than even the most judicious method of handling it. And in cases, where such remedies have been previously used, I verily believe the sudden reduction of the piece of gut is often more owing to their effect than to that of the hand. But I must desire that this may be rightly understood, and not mistaken for a dissuative against manual attempts for reduction; I only mean, that there is such a state of an incarcerated intestine, (which state I have just described) in which, from its size, inflammation, distention, &c. compression by the hand is very little likely to procure its return, and very likely, if it does not do so, to do considerable mischief.

safety, nor are we sure that removing the stricture will at this time appease the symptoms, or abate the hazard,—far from it; such an alteration may have already been made in the intestine that a mortification will ensue, tho' it be set free and returned into the belly; a ligature need not be continued round any part of a living animal, until it becomes quite gangrenous, in order to produce its destruction; there is a certain point of time, in which the circulation is so prevented, that the same event will follow, tho' the ligature be then removed. It is indeed a nice, and no very easy matter to find this precise time; but this difficulty and uncertainty are the strongest reasons for anticipating rather than waiting for it; for when in the present case such time arrives, or is nearly arrived, the risque of the operation becomes complicated with that arising from the diseased state of the parts within, and the chance of success is thereby much lessened.

A mortification of the intestine is not absolutely, necessarily, and always fatal;
but

but the instances of those patients who have escaped with life in these circumstances are so very few, that it may fairly be reckoned among the deadly diseases. If the mortified gut returns back into the belly, upon the gangrene taking possession of the parts which bound it, certain destruction ensues; and tho' there have undoubtedly been instances of people who have survived the operation, though it has been delayed till the parts have been in such condition, yet they are so very rare, that they are hardly sufficient to found a reasonable expectation upon, and of the very few who have thus escaped, the majority have been obliged to hold life upon terms which have been very fatiguing and disagreeable.

When the operation shall be thought necessary, the manner of performing it is as follows:

The pubes, and groin, having been clean shaved, the patient must be laid on his back, on a table of convenient height, with his legs hanging easily over the end of it, then with a strait dissecting knife, an incision must be made through the skin, and

membrana adiposa, beginning just above the place where the intestine passes out from the belly, and continuing it quite down to the lower part of the scrotum. Upon dividing the adipose membrane, there generally appear a few small, distinct, tendinous kind of bands, which lie close upon the hernial sac, which must be divided also, as well as the sac; the same knife with which the incision thro' the skin was made will execute this, which should be done with a steady hand, and great caution, it being of very different degrees of thickness in different cases. In the bubonocoele, or that which is confined to the groin, the sac is most frequently thin, consequently more easily divided, and requires greater attention in the operator. In the oscheocoele, or scrotal hernia, if it be recent, the sac is usually thin also; if ancient, it is sometimes of considerable thickness; but whatever be the state of it, if the operator has any doubt, let him, as soon as he has made a small puncture, in what appears to him to be the hernial sac, endeavour to introduce a probe into it; this will give him the necessary satisfaction; for

if he has not pierced the sac, the probe will be stopped by the cells of the common membrane, and if he has, it will pass in without any obstruction. The place to make the incision in the hernial sac, is about an inch and half below the stricture, and need not be larger than to admit the end of the operator's fore-finger, which, considering the great dilatibility of these membranes will be a very small one; the fore-finger, introduced into this aperture, is the best of all directors, and upon that a narrow bladed, curved knife, with a bold probe point, will be the only instrument necessary to finish the operation. With this knife on the finger, (the point of the former being always short of the extremity of the latter) the sac must be divided quite up to the opening in the tendon, and down to the bottom of the scrotum.

Upon the first division of the sac, a fluid generally rushes out, which fluid is different in quantity, colour, and consistence, according to the date, size, and some other circumstances attending the rupture.

This fluid has sometimes been mentioned as a defence against an accident from

the knife, in the first division of the hernial sac, as if it kept the intestine at such a distance, as thereby to lessen the hazard of its being wounded; but this is a very fallacious circumstance, and never to be trusted; the security of this operation depends intirely on a competent knowledge of the parts, a steady hand, and an attentive eye.

Different operators, especially among the French, have proposed a number of different instruments for the safe performance of this incision; the bistouri cachée, the bistouri herniare, the winged director, the blunt scissars, &c, &c. &c. all which are calculated for the defence and preservation of the intestine, in the division of the sac and tendon; but whoever will make use of the two knives just mentioned, will find, that he will never stand in need of any other instrument, and that he will with them be able to perform the operation with more ease to himself, with less hazard to his patient, and with more 'ap-
parent

' They who are not accustomed to perform operations of such consequence as this is, are apt, from timidity, to
be

parent dexterity, than with any other whatever.

The sac being laid open, the intestine generally pushes out immediately, (unless it is confined, by being enveloped in the omentum) and appears to be much more
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be too sparing in making their incision, by which means they add considerably to their own embarrassment, and to the fatigue of the patient. A free division of the hernial sac and scrotum downwards, gives room for the more easy admission of the finger into the stricture, in order to divide it, and affords an opportunity of handling the intestine or omentum more gently, as well as properly, in order to return them into the belly, both which necessary parts of the operation are much impeded by a small incision.

As therefore no possible advantage can arise from a small wound, but on the contrary it may be attended with great inconvenience, both to the patient and surgeon; I would take the liberty of advising when such an opening is made in the hernial sac, as will admit the operator's fore-finger, and upon it his knife, that he immediately divide the sac and scrotum down to the bottom. It is true that upon such division the quantity of intestine will seem to be increased, and an ignorant by-stander may be alarmed at this fallacious appearance, which is produced merely by the confined, compressed gut being set free, and not by the addition of any more. The advantage which will arise to the operator, and consequently to the patient, from such division, is real and great, it will enable the former to finish his work with freedom, and spare the latter a great deal of pain.

in quantity than it seemed to be, while it was confined within the scrotum.

This is the time to try whether by gently drawing out a little more of the gut, its bulk cannot be so reduced as to enable the surgeon to return it back into the belly, without dividing the tendon. In the case of the protrusion of a very small piece of intestine, it has been found practicable, the difficulty of returning a large portion arising principally from the quantity of mesentery engaged in the stricture; and indeed, though it may now and then happen that a small piece of gut may be returnable without a division of the tendon, yet if it cannot be very easily accomplished, it had better not be attempted, since in the state which this part must necessarily be to require the operation thus far, any degree of force used to it will most probably be more prejudicial and hazardous than the rest of it, if performed properly with a knife.

An attention to the natural structure, figure, and direction of the parts, will give us the best information how to make the division of the stricture to the best purpose, and with the least hazard.

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The tendon of the obliquus descendens muscle runs in an oblique direction from above downward, and the natural opening which is always found in it, and thro' which the hernia passes, is made by a kind of separation of the fibres from each other; the direction of this opening is the same as that of the tendon, that is obliquely downward, from the os ilion to the os pubis; the knife therefore should be so managed, as rather to continue this separation, than to make any transverse section; its edge should be applied to the superior and posterior part of the oval, and carried upward, and obliquely backward, until a sufficient opening is made to serve the purpose; by this means the fibres of the tendon will be rather separated from each other than cut, and in all probability the risque arising from the incision will be lessened.

It is generally advised to make the division of the stricture free, and large, as well to admit the easy return of the parts, as to prevent the inconvenience which it is supposed will be more likely to attend a small wound in a tendinous body than a large one; the first intention, the easy return of the intestine, should certainly be fulfilled,
and

and therefore the incision ought always to be large enough for that purpose, and to afford an opportunity of passing the end of the finger round on the inside, in case of any adhesion; but as too large an opening may be attended with very ill consequence, it ought also to be guarded against. In the majority of cases, a small incision will be found sufficient for the purpose of reduction; and where the parts are free from adhesion, and the safe return of them is the only object of attention; a small division made in the manner already directed is not liable to any more pain or trouble than a large one, and may therefore be safely trusted.

Among the authors who write from each other, and not from practice, are to be found accounts of cases, in which the tendon only has been divided, and not the hernial sac, which latter has been returned thro' the enlarged opening, with its contents inclosed; and the same writers are very particular in their directions how to accomplish this operation. If it was practicable, (which the universal adhesion of the sac to the cellular membrane of the spermatic chord renders absolutely not so) there

there would be still several material objections to the doing it, which objections, as the thing is not capable of being executed, it is needless to mention.

Though I am perfectly satisfied that the case of a strangulated hernia is most frequently as I have represented it, viz. that the disorder in the intestine is originally produced by the stricture made on it by the borders of the tendinous opening of the abdominal muscle, and that the gut is in general perfectly sound, and free from disease, before it becomes engaged in such stricture, yet I think it right to acquaint the uninformed reader, that it has been, and still is the opinion of some very ingenious men, that the disease is originally in the gut, and that the stricture is an accident arising from the inflammation and distention of it; or, in other words, that the intestine is first inflamed, and by means of the alteration produced by such inflammation, becomes too large for the tendinous aperture, which therefore makes a stricture on it, and which, they think, is the reason, why the chirurgical operation is often unsuccessful.

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For my own part I cannot think that either the fact, or the inference is in general true.

An inflammation most certainly may, and frequently does attack any part of the intestinal canal, and consequently that part of it which happens to be included within a hernial sac may accidentally be so affected; when this is the case, the swelling and distention which naturally and necessarily attends an inflammation of the gut, will render it less capable, or perhaps quite incapable of repassing the opening in the abdominal tendon, which tendon may therefore make such stricture on the part so diseased, as greatly to heighten the first symptoms, and bring on still worse; and when this happens, the operation will also be less likely to be successful, it being calculated for the relief of only such symptoms as arise from a piece of intestine (in other respects sound and free from disease) being so bound by the said tendon, as to have its peristaltic motion, and the circulation of the blood through it, impeded or stopped; whereas the other complaint, consisting primarily and originally in an inflammation of the gut itself; the mere removal of it from stricture, is not, nor can be

be equal to the cure of the disease. That the case is a possible one I make no doubt, having once or twice seen it in old ruptures, but it is a very rare one, and by no means to be admitted either as a proof that the mischief done to the intestine, in the generality of strangulated ruptures, does not most frequently proceed from the stricture made by the tendon, or as a dissuasive from performing the operation, whenever it would otherwise be thought necessary.

It is not however a mere speculative point, it is really a matter of consequence, and ought to be attended to by all those who have it in their power to make frequent observations on such subjects; for on the truth or falsehood of this doctrine depend a few very material points in practice, some of which ought so to influence a surgeon's conduct as to make it considerably different in one case from what it should be in the other.

Very bad symptoms, such as pain, tension of the belly, sickness, vomiting, hiccough, fever, and suppression of stools, are often produced in a very short space of time by the descent of a piece of gut upon some
exertion

exertion of strength, in persons who were immediately before such accident at perfect ease, and free from all complaints relative to the belly; if the disease be not discovered, or if our attempts to reduce the intestine are not successful, these symptoms are heightened, and the patient often dies of a mortification; if we do succeed in the timely reduction, all these terrible symptoms often cease instantaneously, and the patient feels neither pain nor inconvenience of any kind from that moment. Would this most probably and most frequently happen, if the disease was generally in the intestine, and the stricture of the tendon merely accidental?

In that kind of disease of the intestinal tube, which is said to be produced by inflammation, and thought to be attended with spasmodic stricture, or contraction of its muscular fibres, there is such an alteration made in its peristaltic motion, and such impediment in the execution of its principal offices, that what is taken into the stomach is rejected by vomit, and the fæces are not protruded thro' the colon and rectum, the belly is tight and painful, the
skin

skin hot, the pulse quick and hard, and the patient feels a restlessness and anxiety which are very disagreeable: this is one of those cases which require immediate assistance, and will admit of no delay; the progress of the symptoms from bad to worse is generally very rapid, and if the disease be not soon subdued, the patient dies. Free and repeated evacuation by phlebotomy, and lenient purges, the use of a semicupium, a warm bath, glysters, and sometimes brisk cathartics, joined with opium, are the remedies generally prescribed, and if made use of in time, are often successful, but if neglected, the case most frequently ends ill.

It is very true that the same symptoms occur in a strangulated hernia; but if that hernia be reducible, they generally cease upon such reduction, nor does the patient want any other assistance than what is necessary to prevent a new descent of the gut: in this respect therefore the two cases differ very materially; in the latter, nature stands in need of no farther assistance from art, but as soon as the manual operation is performed, returns to the execution of her

her natural functions; in the former she is found so very insufficient toward assisting herself, that it seems to be one of the few cases, in which medical assistance can hardly ever be dispensed with.

Now if the bad symptoms attending an unreduced rupture were primarily owing to an inflammation of the intestine within it, and that the tendinous aperture made a stricture on it, only in consequence of the distention of the gut; allowing this stricture to aggravate the complaint considerably, yet the division of it, or the reduction of the intestine, can never be supposed to do more than alleviate, or remove such aggravation; the original inflammation of the gut must still remain, nor can it be supposed to be lessened by the intestine having been girt tight by the tendon; and yet, as I have just now observed, we very rarely (at least in ruptures that are not of ancient date) meet with any trouble or complaint after reduction is timely and compleatly made, and the intestine returned into the belly in a sound state; the vomiting most frequently ceases immediately, or in a very short space of time;

time, a discharge is made by stool, the tension of the belly goes off, and tho' the patient is not always instantaneously well, in cases where the symptoms have been very threatening, yet all such complaint as proceeded from an obstruction to the execution of the proper offices of the intestinal canal, generally disappear immediately.

From the nature and progress of the symptoms, in a *miserere* (as it is called); from the extreme pain of the first attack; from the perfect ease a little while before death; and from the mortified appearance of the intestines after such event, I think it is most probable that if we could have an opportunity of seeing the intestine during the first part of this complaint, we should find all the appearances of inflammation; whereas in many of those upon whom the operation for the bubonocoele is successfully and timely performed, this is not the case; the intestine seldom bears marks of high inflammation, unless the operation has been long delayed, nor do the symptoms of such complaint usually attend afterward. The mortified part often does not exceed an inch, or an inch and half in
H length,

length, and is almost always confined to that part of the gut, which is on the outside of the tendinous opening, all within the belly being found and fair. To which may be added this circumstance, that when the parts contained in a hernial sac become mortified by the delay of the operation, the sac itself, (which has no immediate connection with the intestine, or its vessels) the cellular membrane covering it, nay the skin is often found in the same state.

These are my principal reasons for believing that the mere stricture made by the tendon, is, in the generality of incarcerated ruptures, not only a sufficient, but the primary, and indeed the sole cause of all the symptoms, and all the mischief; and therefore I must also be of opinion, that whoever neglects to perform, or at least to propose the operation, when he finds reduction impracticable, and the symptoms pressing, does in some measure contribute to the destruction of his patient^r.

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^r Indeed, tho' we should suppose the case to be as those gentlemen have represented it, viz. that the complaint begins

On the other hand, I am convinced by some instances which I have met with, (and which one time or other I hope to be able to present to the publick, in a collection with many others) that the opinion has some foundation in truth, and that persons labouring under old ruptures, which have been long in the scrotum without giving any trouble, in which the quantity of intestine is often very large, the tendinous aperture much dilated, and the hernial sac thick and firm, are those to whom this misfortune has happened, and who indeed, if their case be duly considered, will be found most liable to it; there being

begins in the intestine, and that the stricture made by the tendon is not a primary cause, but an effect of the disease, I do not see how we can avoid proposing the operation; for whether the increased size of the gut be owing to the inflammation, which renders it too large to pass the abdominal opening, or whether it be the mere effect of stricture made by the tendon, in either case it will bind equally, and the event must be exactly the same, as far at least as the stricture has to do with it: for when the intestine is inflamed, whether such inflammation preceded or succeeded the confinement of it by the tendinous opening, the symptoms can never be appeased, but by the release of the gut from its confinement.

being no reason in nature why that part of the intestine which is contained in such a hernia, should not be subject to every complaint, or disease, to which every other part of that canal is liable; and this opinion I am more confirmed in, by having met with more than one subject with such old ruptures, who have had all the symptoms of a strangulation, and in whom, I am sure there was no stricture made by the tendon, though the gut remained in the scrotum.

- Although I have thro' the course of this
- section repeatedly recommended the early performance of the operation, yet I must desire not to be misunderstood, as if I meant to advise it before proper attempts had been made for reduction, or the symptoms become alarming; much less that I would propose it as a means to obtain a radical cure in those ruptures which are returnable by the hand merely; a thing boasted of, and practised by pretenders, but not to be thought of by any man who has either judgment, humanity, or honesty.

The only intent of it should be to preserve life, by rescuing the patient from the hazard

hazard of mortification, likely to ensue from the stricture; and though I have pressed it with such view, and in such circumstances, and think it ought always to be done, yet I should be very sorry to have it thought that I encouraged the performance of it wantonly, or unnecessarily, which must be the case, whenever it is done with any other intention.

Considered as a means to obtain a perfect or radical cure, or to prevent the necessity of wearing a truss, every man at all conversant with these things knows, that it most frequently fails of procuring that end, and that most of those people who have been obliged to submit to it for the preservation of their lives, have also been obliged to wear a bandage ever afterwards, to prevent the intestine from slipping down, behind the cicatrix, into the groin.

In short, though the danger from the operation, when performed in time, is in my opinion never to be mentioned with that which must arise from the stricture, if neglected, yet it never ought to be attempted but with a view to prevent the

impending ill effects of such stricture, and will not ever (I dare believe) be put in practice with any other intention, by any fair or judicious practitioner, by any man who has the least regard for his own character, his fellow-creature's sensations, or for any thing but money¹.

THE sac and stricture being laid open and divided, the contained parts come into view, and according to the different circumstances of the rupture, and of the patient, will be found in different states, and require different treatment.

These states are reducible to three general heads, that is, the contained parts will be found, either in a sound, healthy, loose, unconnected state, and fit for immediate

¹ Perhaps it may appear extraordinary, but this necessarily severe operation, has by some of our modern quacks, been recommended, and even practised, for the cure of omental hernias; more than one person has lost his life, that is, has been murdered in the attempt; but that seems to be a circumstance of small importance in the minds of these operators, nor does it at all prevent the credulous part, that is, the majority of mankind, from trusting them; though one would imagine that much stronger proofs, either of the judgment, humanity, or honesty of such practitioners were not requisite.

diate reduction; or in a sound state, but from some particular circumstances, incapable of being immediately replaced, or in an unsound, diseased state, and requiring to be treated accordingly.

If the rupture consists of a piece of intestine only, and that neither mortified, nor adherent, the sooner it is returned, the better, and the more gently it is handled for reduction, the better also.

If the intestine be accompanied with a portion of omentum, the latter (if in a proper state) should be returned first.

In returning the intestine, care should be taken to endeavour to put in that part first which came out last, otherwise the gut will be doubled on itself, and the difficulty and trouble be thereby much increased; and in making the reduction, the fingers should be applied to that part of the intestine, which is connected with the mesentery, rather than its convex part, as it will both serve the purpose better, and be less likely to do mischief.

While the reduction is making, the leg and thigh on the ruptured side should be kept elevated, as such position of the

limb will much facilitate the return of the parts.

Long confinement in the scrotum will in some people produce slight adhesions, by slender filaments, which are generally very easily separated by the finger, or divided by a knife, or scissars, whether the adhesions be of the parts of the intestine *inter se*; or to the hernial sac. If the adhesion be of the former kind, and such as proves very difficult to separate, it will be better to return the gut into the belly as it is, than to run the risque of producing an inflammation by using force; if it be of the latter, that is, if the connection be with the sac, there can be no hazard in wounding that, and therefore it may be made free with.

It has been said by some writers, that if the piece of omentum be so very adherent, that the surgeon does not chuse to separate it, that it may very safely be left, that it will first suppurate and then shrink, and very little retard the healing of the sore. What experience the gentlemen who talk in this manner may have had of this kind of case, I know not, but I never yet have
seen

seen any, in which it could possibly be thought necessary to leave the patient in such circumstances, or in which an attachment of the omentum was incapable of being set free, either by dissecting its adhesions, or retrenching a part of it.

The prolapsed parts being replaced, the next object of consideration is the hernial sac; this, if large, thick, and hard, will prove slow, and difficult of digestion, render the edges of the sore tumid, and painful, and often retard a cure considerably, by producing troublesome abscesses in the scrotum.

A considerable part of it may very safely and properly be removed; no part of it is of any consequence, except the posterior, or that with which the spermatic vessels are connected, all the rest being loose, by means of the cellular membrane, is therefore very easily separable, and had better be removed than left.

It has been proposed by theoretic writers to pass a ligature round the upper part of the neck of the sac, in order as it is said to procure the union of its sides, and thereby more certainly to prevent the future

ture descent of any thing from the belly : but to this there are many objections ; the principal of which are, that if the ligature was not made strict, it could serve no purpose, and if it was, it would be very likely to injure the spermatic chord, if included in it ; by preventing part of the discharge, it might also occasion very troublesome symptoms ; and, upon the whole, is by no means adviseable.

It has also been supposed that the intestine may be found so adherent, as not to admit of being set free, and in this case it has been advised to remove the stricture, by dividing the sac, and the tendon, and then to leave the parts loose. This is mentioned by many writers of eminence, and therefore I have taken notice of it, though it is a kind of case which, I must own, I have never seen, nor do I suppose that I ever shall. I have seen the intestines very firmly adherent to each other, to the sac, to the omentum, and to the testicle ; but never in such a state of adhesion, as to be incapable of being returned. The adhesion of the parts of the intestine *inter se*, are most frequently easily separated ;
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but if they should not, still these are no hindrance to the gut being returned; and if the caul be so connected as to prove troublesome to detach, it may with great safety be cut off; so that the connexion here meant, must be of the intestine with the hernial sac: of these two parts we are interested only for the preservation of one, and may without hazard make free with the other; the separation may indeed be tedious, and sometimes difficult, but let the difficulty or trouble be what they may, the separation must be accomplished, it being absurd to think of leaving a piece of intestine loose, in the divided scrotum, which, from the removal of the stricture above, will be liable to be increased in quantity, from every unguarded motion, and subject to all the inconveniencies which the influence of the air must necessarily produce on such tender parts; not to mention the great difficulty of managing the sore in this state, and the pain, and other bad symptoms, which must arise from the daily uncovering the intestine. Any trouble, therefore, which may attend the separation, must be submitted to, rather

ther than to follow this strange advice, which indeed the writers who give seem not to understand, for to leave the parts as they were found, and as they direct, is impossible; they were found contained in a hernial sac, and in the scrotum, defended from the air, and in some degree limited as to quantity, both by the stricture above, and the sac below; the necessary operation has removed that stricture, divided the sac and scrotum, and set all loose and free, and therefore if the intestine be not returned into the belly, and kept there, the quantity which may fall out, may be so large as to produce the most fatal consequences, notwithstanding any attachments which some part of the canal may have contracted.

SECTION VI.

HITHERTO the parts composing a rupture have been considered as displaced, as inflamed, as having contracted unnatural connections and adhesions, but being still so unhurt in their texture, as to remain

remain sound, within the laws of the circulation, fit to be returned into the belly, and affording a reasonable prospect of success in the event.

But, on the other hand, if the inflammation ran very high, and has either been neglected, or not given way to proper treatment, and the operation has been too long deferred, the parts, tho' loose, may become so diseased, as to be unfit for immediate reduction.

The disease here meant is gangrene, or mortification, produced by the stoppage of the circulation of the blood through the part which is on the outside of the stricture. The gangrenous, or mortified state of these parts may be of more or less extent, according to the quantity contained in the sac; but be the extent of such disease what it will, the part so affected ought never to be returned loose into the belly, (more especially if it be intestine) without some caution.

The omentum indeed may be made more free with. If this is so altered as to be plainly unfit for immediate reduction, it may be removed, that is, the altered part may be cut off from the sound.

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This is certainly true; but it is a point of practice which appears to me to deserve somewhat more regard than is most commonly paid to it by writers. All that is generally said of it is, that if the omentum be found in an unsound state, a ligature should be made on it just above the altered part; what is below such ligature should be cut off, and the ligature should be left hanging out of the wound, that it may more easily be taken away, when it is cast off. This is the general doctrine, and indeed the general practice; but which I cannot help thinking is delivered down, and followed by us somewhat inconsiderately.

When the omentum is in such state as to be fit for being returned into the belly, such return ought never to be neglected, or omitted; the uses of the caul are great and obvious, and the want of it must be productive of inconvenience to the patient; its warmth, its greasiness, its lubricity, its extension over the surface of the intestines, together with the constant motion of that canal, prove its utility, and in some measure point out what the inconveniencies must

must necessarily be, which follow the removal of it. But it is sometimes found in such state, as to be unfit for reduction; and then we must embrace the lesser of the two evils, and remove such part of it as we ought not to return. This is said by every body, and is certainly true; but seems to me, as I have just now observed, to require more consideration than is generally spent upon it, as well with regard to the state requiring such operation, as the manner of executing it. It is commonly said that if it be found in large quantity, considerably hardened, or if it be altered in its texture, (that is, by gangrene or mortification) that it ought to be retrenched. The two states said to require this retrenchment are very materially different from each other; the necessity of it in the latter is evident; but I cannot help saying that I think it is ordered in the former very unnecessarily; and that the general method also of performing it in the latter, appears to me to be both injudicious and prejudicial. There may possibly now and then occur a case, in which such alteration may have been made in
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the mere form and consistence of the prolapsed piece, by induration, enlargement, &c. that the removal of a part of it may become necessary; but this, though it does happen sometimes, is very unfit to be made a general rule of. The reason given, is, that it will lie uneasy in a hard lump within the patient's belly; which is not necessarily or generally true, as I have several times experienced; having returned it when its form and consistence have been much altered, without finding any future inconvenience: so that such alteration merely, is not a general reason for cutting it off.

On the other hand, I am ready to allow, that it sometimes is, and that the piece of caul so altered had better be removed, and that it may also be so connected, that it will be more to the patient's advantage to have such connected part taken away at once, than go through the pain and fatigue which the separation may require; in which case, my objection lies principally against the prescribed method by ligature. Indeed when it is in a gangrenous state, a part of it must necessarily be removed,

as such state makes the return of it into the belly highly improper. To accomplish this, we are ordered to make a ligature on the sound part of the omentum, just above what is altered, and then to cut it off immediately below such ligature: and the reason given for doing it in this manner, is, that all the altered part may be removed without any risque of hæmorrhage. This method of acting is founded on a groundless fear, and is often attended with bad consequences, which not being supposed to flow from this cause, are not set to its account.

The fear of hæmorrhage from the divided vessels, if the omentum be cut in a sound part, and the apprehension of mischief, likely to ensue from the shedding of sanies, or matter into the belly, if the division be made in the diseased, gave rise to the practice of tying it before amputation; but neither the one nor the other of these apprehensions are well grounded, nor are they sufficient reasons for such practice. The fear of hæmorrhage is almost, if not perfectly without foundation, as I have several times experienced; and the dis-

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charge of a fluid of whatever kind from the border of the divided membrane, is of no consequence at all; neither would the ligature prevent it if it was, as must appear to every one who will give the subject one moment's serious consideration.

But this is not all: I am sorry to say that I am by experience convinced, that making a ligature on the caul is not only unnecessary, but frequently pernicious, and sometimes even fatal.

A mere theoretical consideration of the parts will convince any one of the probability of mischief arising from such practice; but besides these considerations, I can take upon me to say, that I have seen it add to the hazard of the case, and more than once destroy the patient; I have seen the omentum become diseased, and gangrenous in all its extent, above the ligature, between it and the stomach, when it was not gangrenous at all before it was tied; but on the contrary, in a sound state, and only tied in order to its being more securely re-trenched, I have seen a whole train of bad symptoms, such as nausea, vomiting, hic-cough, fever, anxiety, restlessness, great
pain

pain in the belly, and an incapacity of sitting upright, or even of moving, without exquisite pain, precede the death of a man, whose omentum was tied, merely because of its enlargement, whose intestines uninterruptedly from the time of the operation to his last hour, performed their proper office of discharging the fæces, and were found perfect and untainted after death, but whose omentum appeared in a highly inflammatory state in general, and in many parts above the ligature gangrenous.

The direction given by many writers to put the patient's body in motion, or to give him a kind of shake, in order to set to rights the disturbance and derangement produced by tying the caul, would be too absurd to mention, did it not serve to prove that even the very people, who have persisted in this pernicious practice, were themselves sensible of some of its probable ill consequences; though they would not try to remedy them; they thought that those which might follow from hæmorrhage, or the discharge of sanies, were still greater, but made no experiment, in order to know whether they were or not.

I will not pretend to say that there never was a dangerous, or fatal flux of blood, from the division of the omentum, without ligature, but I can truly say that I never saw one ; that I have several times cut off portions of it, without tying, and never had trouble from it of any kind, though I have always made the excision in the sound part, and that from the success which has attended it, I shall always continue to do so, whenever it shall become necessary. Upon the whole, I cannot help thinking the ligature both unnecessary and pernicious, and can venture from experience to say, that any portion of the caul, which it may be thought necessary to remove, may very safely be cut off, without any previous tying.

The best and safest method of performing this operation, is with a good pair of straight scissars, having first expanded it, as well on account of its more easy division, as to prevent the mischief which would attend the cutting a piece of intestine, if it should chance to be wrapped up in it ; and if any fear still remains of hæmorrhage, the excision may, in the case of
morti-

mortification, be made just within the altered part of it; in which case, there will no more be left to be cast off, than there must be when a ligature is made.

If the gangrene, or sphacelus, have taken possession of the intestine, and consists of a small spot only, which by casting off, might endanger the shedding its contents into the belly; the method of endeavouring to prevent that inconvenience is, by connecting the upper part to the wound by means of a needle and strong ligature; by this means, when the mortified part separates, the fæces are discharged by the wound for some time; after which it has been known to contract gradually, and heal firmly; but whether the event proves so lucky or not, this method of securing the gut should never be omitted.

In making this artificial attachment of the intestine to the inside of the belly, care must be taken not to wound the gut, the needle must be passed through the mesentery, at a small distance from the intestine, and such a portion of that body included within the stitch, as shall be likely to hold fast long enough to render the connection

probable. If the altered portion of the gut be of such extent, as to require excision, but yet not so large as to prevent the extremities of the divided parts from being brought into contact with each other, their union must be endeavoured by suture; in doing this, the ends of the intestine should be made to lie somewhat over each other, by which means the suture will be the stronger; and when the two ends are thus sewed together, they must both be fastened to the inside of the belly, at the upper part of the wound, that in case the union does not take place, the discharge of fæces may, if possible, be made through the groin. But if the disease is of such extent as to prohibit the bringing the two ends together, the treatment must be different. In this case, as it is impossible to preserve the continuity of the intestinal canal, the aim of the surgeon must be to prevent the contents of it from being shed into the belly, and to derive through the wound in the groin, all that which should, in a sound and healthy state, pass off by the rectum and anus.

To

To accomplish this, he must take care that neither extremity of the divided intestine slip out of his fingers; then with a proper needle, and a strong ligature, he must connect both of them to the upper edge of the wound; the suture, with which the connection is made, must not be slight, lest it cast off before a due degree of adhesion is procured; and it must also be made in such a manner as to preserve the mouth of the gut as free and as open as may be, upon which the patient's small remaining chance does in some measure depend. The method advised by La Peyronie, of stitching the mesentery instead of the intestine, is judicious and right.

The dressing in this case should be as soft and as light as possible, nothing heavy, nothing crammed in, nothing which can irritate or give pain; and the patient must observe the most rigid severity of diet, and the most perfect quietude both of body and mind: with regard to medicine, whatever is exhibited must be calculated to procure rest and ease, to quiet the febrile heat, to keep the body open, and if necessary, (as it most frequently must be) to resist putrefaction.

All the rest must be left to nature, who is by her great Creator furnished with such powers, as sometimes to produce wonderful effects, even in these deplorable cases.

This is the substance of the best practice, and of the most approved doctrine, in these circumstances, and which has sometimes been attended with a fortunate event, but the practitioner who is so situated as to see but little of this kind of business, ought to be apprized how very little reason there is to hope for, or to promise success.

More censure is incurred by an unguarded prognostic, than by a successful event, if properly and judiciously foretold; and if a man was to form his judgment upon this, and some other hazardous disorders, from books only, he would expect very little of that trouble and disappointment, which he will most certainly meet with in practice.

Writers in general are too much inclined to tell their successes only, and are fond of relating cases of gangrene and mortification, in which large portions of intestine have been removed, the proper operations performed with great dexterity, and

and in which the events proved fortunate; and of this they all give us instances, either from their own practice, or that of others, or perhaps sometimes from imagination; by which the young reader is made too sanguin in his expectation.

That these extraordinary successes do sometimes happen is beyond all doubt; and it is every man's duty to aim at the same by all possible means; but still the inexperienced practitioner should also be informed, how many sink for one that is recovered, and how many lucky circumstances must concur, with all his pains, to produce a happy event in these very deplorable cases. Without this caution he will meet with very irksome disappointments, and having been often baffled, where he thought he had good reason to expect success, he will sometimes meet with it so very unexpectedly, that he will be inclined to believe the sarcastical distinction between cures, and escapes, not ill-founded.

To say the truth, the hazard is so great, and the utmost power of art so little, that what Iapis said to Æneas with relation

tion to his cure, may with great propriety be said here.

*Non hæc humanis opibus, non arte magistra
Proveniunt; neq; te Ænea mea dextera servat:
Major agit Deus.*

SECTION VII.

THE portion of intestine, or omentum, which composed an hernia, being replaced, while sound and unhurt, either by inflammation, or gangrene, it had always, till very lately, been supposed, that if a new descent of them was prevented by the immediate application of a bandage, no mischief was likely to ensue, and that while the truss executed its office properly, the patient was thereby free from danger.

But within these few years, it has by some of the French writers been said; that the hernial sac may be so loose and unconnected with the spermatic chord, that it may be returned into the belly, while it contains a portion of intestine, labouring
under

under a stricture made by the neck of the said sac; and of this they have given instances of cases,—or of what appeared to them to be so.

Mr. Le Dran tells us, that in one of these, the rupture was with some difficulty returned, but the symptoms nevertheless continuing, the patient died; and that upon opening the body he found the hernial sac including a considerable portion of intestine, returned into the belly; and that the stricture made by the neck of the sac, bound so tight, that he could not disengage the gut from it without cutting it;—his words are,

“ Nous trouvames dans le ventre le sac
“ herniare, qui avoit trois pouces de pro-
“ fondeur, sur huit pouces de circonfe-
“ rence; et dans ce sac etoit encore en-
“ fermée une demie aulne de l'intestine
“ jejunum. Tenant le sac à plein main,
“ je voulus en faire sortir l'intestin, en le
“ tirant par l'un de bouts; mais la chose
“ me fut impossible, tant l'entrée du sac
“ etoit resserrée, & je n'en vins au bout,
“ qu'en dilatant cette entrée avec les ci-
“ seaux.” &c.

In De la Faye's notes on Dionis may also be seen an instance of this kind of case, or at least of what was taken for such.

I have already given my opinion concerning the practicability of returning a hernial sac back into the abdomen, after it has been out any considerable length of time; I never saw, either in the dead or the living, any reason to suppose it possible; the assertions of these gentlemen are very positive, and I must leave the reader to judge of them as he can.

The straitness of the neck of the sac is supposed to be produced by the pressure of the bolster of a truss, worn to keep the parts from descending. This part of the supposition is probable, but it must also be considered, that the same pressure must almost necessarily occasion adhesions of the outside of the sac to the surrounding cellular membrane; and if we were to suppose the sac loose and unconnected in every other part, (a thing I must own I never saw) yet this alone would for ever prevent its return into the belly.

It

It is indeed represented as a circumstance not very frequently occurring, which is fortunate for mankind; as it can neither be foreseen nor prevented, and would add considerably to the hazard of ruptures.

It is said, that by carefully attending to the manner in which a rupture goes up, we may distinguish whether the sac returns with it or not; that if it does, including the gut, a hard body will be perceived to pass under the finger, and that the intestine in its passage through the abdominal opening, will not make that kind of guggling noise, which it is usually found to do, when the sac does not return with it. This instead of being the characteristic mark of the return of the sac, will almost always be found to be the case, when a portion of omentum which has been much compressed, goes up at the same time with the gut; and therefore, however ingenious this observation may seem, considered theoretically, it is not to be depended upon in practice.

But supposing we had some clear and undoubted marks, by which we could always know when this was the case, I do not see how we could avail ourselves of them;

them; the intestine must be returned before we can have our information; and if instead of the uncertain, delusive reasons just given, we had the clearest and most satisfactory marks of what is suspected, we have no remedy, but a very perplexing, tedious, and painful operation, which, I fancy, as few surgeons would in these circumstances choose to perform, as patients submit to.

I call these marks or symptoms, which these gentlemen have given us, doubtful and delusive, because they do not with any degree of certainty indicate the cause to which they are owing, or from which they arise; for the inflammation excited in the intestine by its having been engaged for some time in a stricture, will sometimes produce all the same complaints after its return; but no chirurgical operation will relieve them.

In the common reduction therefore of an intestinal rupture by the hand, I do not see how we can avail ourselves of this supposed discovery; and when the operation by the knife becomes necessary, it can be of no consequence at all; for if the operation

ration be properly performed, the hernial sac will be divided thro' its whole length, before the instrument reaches the tendon; and therefore the gut can never be returned, while bound by any stricture from the former.

It has indeed been said, that till this discovery was made, the stricture of the abdominal tendon, and the adhesion of the contents of the hernial sac to its sides, were the only known reasons why any rupture should be irreturnable; and that when such case occurred, if the tendon only was divided, and the sac reduced unopened, the patient might be lost notwithstanding all that had been done. To this I can only say, that a stricture made by the sac only, is far from being a thing unknown, and is one of the principal reasons why all judicious writers and practitioners have advised it to be always divided; and when this is properly executed, no such consequences can follow, even if the hernial sac should be (what I have never yet seen) capable of being returned into the belly.

SECTION

SECTION VIII.

RUPTURES through the openings of the tendons of the oblique muscles in females, are subject to the same symptoms, and require nearly the same general treatment, as the inguinal ruptures of males, and, like them, frequently admit of perfect cure, if not mismanaged or neglected at first; the same kind of truss is also necessary, and the same cautions with regard to the manner of wearing it.

The open texture of the cellular membrane surrounding the spermatic vessels, and the laxity of the scrotum, render the hernial tumor much larger in males than it can well be in females; neither can it descend so low in the latter, as it does frequently in the former, for reasons which are obvious.

The female hernia, if recent, has much the same appearance as the bubonocoele in man; and when more of the gut or caul is thrust forth than will lie conveniently in the groin, it pushes down into

one of the labia pudendi, and sometimes forms a tumor of pretty considerable size.

When easily reducible, like that of men, it gives but little pain, and generally returns into the belly upon going to bed, or upon the patient being laid in a supine posture: when it is bound by the opening of the abdominal tendon, and is therefore difficult, or incapable of reduction, it is attended with the same symptoms as the incarcerated hernia in man, and requires the same general treatment, of bleeding, glysters, purges, warm bath, &c. and (these failing) the chirurgic operation; by which the hernial sac is laid open, and the stricture made by the tendon, divided.

In males the cellular membrane which surrounds the spermatic vessels, and the hernial sac, is generally so thickened by distention, as to take some little time to cut through, and proves thereby a kind of security to prevent the sac from being too hastily opened; but in females it should be remembered, that the hernial bag lies immediately under the membrana adiposa, and requires to be very cautiously divided, on account of its contents; nor have I in

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general

general observed the fluid contained in the hernial sac of females to be equal to that which is found in males.

The piece of intestine which is strangulated in the female bubonocoele, is sometimes so small, as to occasion very little tumor, and therefore, if recent, is very often, in modest women, not known to be the cause of the symptoms which it produces; but if by accident it returns back before it is hurt in its texture, the disease passes for a cholic; if it proves fatal by mortification, it is taken for a *passio iliaca*, or *miserere*. The means made use of for the relief of either of those diseases, being such as will not, in general, without the assistance of a surgeon's hand, procure a return of the protruded gut, many a useful life has been lost by the real cause of the mischief not being known. Every symptom (the tumor excepted) which accompanies a rupture labouring under stricture, may attend a *passio iliaca*; that is, an inflammation and obstruction to the execution of the office of the intestine, whether produced by the stricture of the abdominal tendon, or the spasmodic contraction of its
OWN.

own muscular fibres, will be attended with the same kind of symptoms; but though the general means of relief are alike in both cases, yet the former requires also the assistance of a surgeon's hand to replace the piece of intestine, or all the rest will be absolutely ineffectual; if that be neglected, the case in general will end ill, and though the mischief is set to another account, and supposed to have been without remedy, yet it is very certain that timely assistance would very frequently prevent such bad consequences. It therefore behoves every medical man, who may be called to women labouring under such complaints, to be very attentive to them, and if the symptoms run high, never to omit inquiring whether there be any tumor in the groin, belly, or pudenda, and if there be such, to be informed of what nature it is, before he goes any farther, or loses any more of that time, which in all these cases is so very precious.

In the case of the dolor colicus, the pain is either round about the navel, or diffused in general all over the belly; the pain arising from a strangulated rupture

is also very frequently general all over the belly, but is always more particularly acute at the groin, which part is also remarkably tender to the touch. The tension of the belly, and the vomiting in the *passio iliaca*, are in general the first, at least they are very early symptoms; whereas they do not in general come on in ruptures, till after some time is past. Perhaps some other minute distinctions might be made between the apparently similar symptoms of the two diseases, but the best and most infallible way to know what the real state of the case is, and thereby what ought to be done, is to have the parts examined where such tumor may be expected; this removes all doubt, and gives the practitioner the satisfaction of knowing, that let the consequence be whatever it may, he is pursuing a rational and probable method of relieving his patient.

SECTION

SECTION IX.

THE crural, or femoral hernia, receives its name from its situation, the tumor occasioned by it being in the upper and fore part of the thigh.

To understand rightly the nature and situation of a crural rupture, it is necessary to attend to the anatomical structure, and disposition of the obliquus descendens muscle of the abdomen. Whoever does this will find that that part of it which runs obliquely downward from the spine of the os ilion, toward the symphysis of the os pubis, is tucked down, and folded inward, as it were. This edge or border, so folded in, is what is called the *ligamentum Poupartii* by some, by others the *ligamentum Fallopii*, as if it was a distinct and separate body, but is really no more than the inferior border of the tendon of the oblique muscle. In all the space between these two attachments, this tendon is loose and unconnected with any bone; all the hollow, which is made by the form of the

os ilion, between the point of the attachment of the ligament, or tendon to that bone, and its other connection at the os pubis, is filled up by cellular membrane, fat, and glands, which parts are covered, and braced down, by a fine tendinous expansion, communicating between the tendon of the obliquus descendens abdominis and the fascia lata of the thigh.

Under this tendon, or ligament, the parts composing a hernia pass, and produce a tumor, on the upper and fore part of the thigh. The sac is generally described as passing over the crural artery and vein, which are said to lie immediately behind it; but whoever will examine the state of these parts in a dead subject, will find that this is not a true representation; the descent is made on one side of these vessels, nearer to the os pubis; and the hernial sac, if it be not greatly distended, lies between the crural vessels, and the last mentioned bone, on which it rests.

The femoral hernia is not so subject to stricture as the inguinal, there being a larger space for the intestine to occupy; but when such mischief does happen, the
symp.

symptoms are so exactly the same as they are in a strangulated inguinal hernia, that it is quite unnecessary to repeat them in this place. The method of attempting reduction, and the treatment of the patient in case of difficulty are the same also, excepting that in the inguinal, the part to be reduced should be pressed obliquely toward the os ilion; in the femoral, the pressure ought to be made directly upward, or a little toward the pubes.

When it is not reducible by the hand only, it, like the other, becomes the object of a chirurgic operation, by which the sac is laid open, the stricture removed, and the prolapsed parts returned.

The incision should be made through the skin, and membrana adiposa, the whole length of the tumor; under these will be seen the tendinous fascia, or expansion, and immediately under that the hernial sac; these being carefully divided, and the portion of intestine thereby denuded, it is well worth while to try, if it cannot be returned without dividing the tendon, as there is a considerable space between the os ilium, and the os pubis, to manage such

reduction in, and as the division of the tendon is not always, in this kind of rupture, so safely executed : in this there are two parts of consequence, which lie very little out of the way of the knife, and which an operator would avoid wounding : these are the epigastric artery, and the spermatic chord. If the division of the ligament be made directly upward, the spermatic chord will certainly be divided, and if, to avoid that, the knife be carried very obliquely towards the os ilium, the artery will meet with the same fate ; and indeed if the incision of the ligament be made of any length, let it be made in whatever part it may, the risque will be great of wounding one of the parts just mentioned, as will appear to any body who will examine them *in situ naturali*, and make a proper allowance for the pressure, and distention of the hernial sac.

Of the two the spermatic chord is certainly the most to be regarded, as the total division of it would in all probability render the testicle on that side useless. If the artery be wounded, it must be taken up with a needle and ligature, but the doing

ing is not so easy as the directing it to be done; the epigastric artery in many men is near as large as the smaller carpal; departs immediately from the trunk of the crural, and, at its origin, lies in a bed of fat and cellular membrane; the stream of blood would be pretty brisk, and the passage of the needle round would certainly be troublesome, if not hazardous from the vicinity of the crural vessels: it may undoubtedly be very happily executed, but as it must be attended with a good deal of trouble, and some risque, it is much better to avoid the necessity, which I think may almost always be done, considering the large space between the os ilion, and the os pubis, and that that space is occupied principally by cellular membrane, and fat; or if the division of the ligament be unavoidable, let the operator be particularly careful to keep the extremity of the probe-pointed knife within the end of his forefinger, held up tight just behind the edge, or border of the tendon, and to make as small an incision as may be necessary: the probe-scissars, the common instrument in
use

use for this operation, is in this case particularly hazardous and improper.

In all other circumstances, this hernia, and the inguinal, are so similar, as to need no repetition.

SECTION X.

The Congenial Hernia.

THE *congenial hernia*, as it is now called, is that particular kind of hernia, in which the portion of intestine, or omentum, which occasions the tumor, instead of being found alone in the hernial sac (as in a common rupture) is found in contact with the naked testicle; the bag containing them being formed by the *tunica vaginalis testis*.

On this species of rupture, a few years ago I published a small ^a tract; on which some reflections were made in the Critical Review, insinuating that I had borrowed the subject or matter of them from Professor Haller, and Dr. Hunter ^b.

Tho'

^a An account of a particular kind of rupture, &c. 1757.

^b March 1757.

Tho' these reflections were said to come from a pupil of the doctor, yet they were by many of my friends thought to be his own; but as the doctor, tho' he had many opportunities, never said a word to me on the subject, I would not suffer myself to believe that he could be the author of them; not only as they were anonymous, but as they contained surmises and conjectures rather than facts: I therefore disregarded them, and should never more have recollected them, had not the doctor made a new charge on me, in his own name, and in such manner as to induce me to believe that what my friends formerly suspected was too true^c.

I am perfectly sensible of how very little importance all these disputes are to all other people except the disputants themselves; and how very difficult it is for any man to tell what relates merely to himself, in such manner as not to tire and disgust those who have no interest in it; but as I have been (to use Dr. Hunter's own word) *wantonly*, and I cannot help thinking
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^c Medical Commentary, No. 1.

malevolently attacked, and treated in a manner which appears to me highly ungenerous, not to say illiberal, I hope the reader will indulge me in the opportunity which this chapter affords of relating the fact; lest my silence should be misconstrued into an acknowledgment of the truth of what the doctor has said.

The appearance which this kind of hernia makes, when the sac is laid open, was first taken notice of by Mr. Samuel Sharp; to him, therefore, the honor of the discovery is most justly due. That gentleman endeavoured to account for it, by supposing that the parts which compose it came originally out from the abdomen, in a common sac; but that in some particular cases, the septum, which divides this bag from that of the tunica vaginalis testis, was broken through, or lacerated; and that one common cavity was thereby formed, containing both the gut and the testicle. Mr. Sharp has too much good sense to be offended when I say that this account did by no means satisfy me.

In

In the latter end of the year 1753, or in the beginning of 1754, (I will not be positive which) Dr. Hunter gave a public lecture at the surgeons theatre.

As his subject was the male parts of generation, as his opportunities of examining dead bodies must have been very frequent, and as he was known to be not only a sedulous, but an ingenious enquirer into the animal œconomy, I flattered myself that I should obtain some new information from him; but the doctor spake of the disease, exactly as Mr. Sharp had done, and gave exactly the same solution of the appearance.

In February, 1756, I published the first edition of this general treatise on ruptures. I had then had but few opportunities of seeing in dead bodies the particular kind of hernia in question, tho' I had often taken notice of it in operations on the living. The accounts given of it by Mr. Sharp, and Dr. Hunter, did not satisfy me, and not imagining it to be so frequent a disease, or so easy to be accounted for, as I soon after found it to be, I called it an *accident*, or a *lusus naturæ*.

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I knew that the testicles of a foetus were always formed within the cavity of the belly, and imagined that the passage of them from thence into the scrotum was one principal cause of the frequency of ruptures in male infants; but was far from being satisfied, or indeed acquainted, with the precise manner in which it occasioned or produced them.

Looking over a little treatise, written in Latin and in French, by one Reneaulme Lagaranne, and published in 1726, under the title of, “*Essai d'un traité des hernies nommées descentes*,” I met with the following passage:

“ Non ideo tamen ita frequenter accideret hernia, nisi alia concurrerent; adest sæpius partium certa dispositio, quæ illius generationem juvat; humiditas, laxitasve membranorum, pinguedinis copia partes pondere suo deorsum trahens, vel quid simile. *At in pueris previa et observatione digna, sæpius reperitur partium bubonocelen adjuvans dispositio: peritonei processus dixere, quos negat Blanchardus, herniæque male curatæ reliquias censet, sed ab aliis perperam* ”

“ ram pro naturali habetur dispositione.
“ *Ubi scilicet vasa spermatica, exteriori*
“ *membrana peritonei circum-septa, ab ob-*
“ *liqui externi annulo, ad testes feruntur,*
“ *ibi in infantibus ductus occurrit cæcus,*
“ calami scriptoris crassitudine, polli-
“ cis longitudine, instar ductuum illorum
“ quos nonnulli observarunt anatomici in
“ canibus, et sub cæcorum nomine de-
“ scripserunt.”

The words struck me, as they seemed to point out a natural cause for the so frequent appearance of ruptures in young children. I immediately opened the bellies of some fœtuses of different ages, which I had by me in spirit, and found the ducts exactly as described by Lagaranne.

The subject had now made an impression upon me, and was uppermost in my mind. I mentioned it to two or three friends, and among the rest to a very inquisitive young gentleman, who was at that time my dresser at St. Bartholomew's hospital. He said that he had a day or two before thrown some injection into a boy, born dead, at the full time, that he would bring it to my house, and that we should examine it together. We did so; we
found

found the ducts open on each side, and tracing them carefully, found also that they led immediately down to the testicles, which lay near the bottom, covered only by their proper coat, called the albuginea.

I do very readily acknowledge, that hitherto I was intent only on finding Lagarranne's *Partium adjuvans dispositio*, the *pre-disposing cause* of a *common bernia*, and that I had no thought of what is now called the congenial; but when I found that the ducts led immediately, and without obstruction, down to the testicles, and that the communication between the belly, and the sacculi containing them, was free and open, Mr. Sharp's observation occurred to my imagination, and I mentioned it to my companion.

As the thing gave me much pleasure, from the probability it seemed to afford of discovering a truth, I took some pains to procure a considerable number of subjects; examined them very carefully; noted all the appearances upon paper; drew such conclusions, as seemed to me most natural from the structure and disposition of the parts; made several preparations, and
shewed.

shewed both the papers, and the preparations to many of my friends, and among the rest to Mr. Serjeant Hawkins, Mr. Sainthill, the late Mr. Nourse, and the late Mr Webb, who seemed to be pleased with what I had done, and advised me to prosecute my inquiry still farther, as opportunity should offer.

When I had examined a great variety of subjects, and found that they agreed in all the principal points, I enlarged my notes, and digested them into better order; and when I had so done, shewed them again to the same gentlemen, who had seen them before.

Having always entertained a high opinion of Dr. Hunter's *anatomical* abilities, I called at his house designing to have told him what I had done, and to have had some conversation with him on the subject: the doctor was not at home, but his brother Mr. Hunter was, and with him I had some talk. The same gentleman also shewed me *one single preparation, tied down, in a glass, in spirit*, exhibiting the situation of the testicles of a foetus pretty near the time of their passing from the

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abdomen

abdomen into the scrotum, of which kind I had then several at home, and which many of my friends had seen. Mr. Hunter did not show me any other preparation of any kind whatever; nor do I remember that the congenial hernia was once mentioned by either of us during my short visit, notwithstanding the doctor has^d said that his brother "showed me his preparations with great readiness, and explained to me his (the doctor's) hypothesis of the contiguity of the intestine and testicle." Our conversation turned intirely on the passage of the testes from the belly into the scrotum, and as far as I could perceive (for he spake with the most cautious, apprehensive reservedness) our sentiments were alike.

My papers were at this time finished, and corrected for the press; had been in the hands of several of my friends; nor did I alter a single syllable in them, in consequence of this visit to Mr. Hunter: but had that gentleman been half so explicit as his brother represents him to have been;

^d See the Medical Commentary.

been; had he been so ingenuous as to have told me that either he, or the doctor, regarded themselves as the discoverers of this part of the animal œconomy, (which I could not at that time have contradicted) had he signified that either of them had any intention to say, or to publish any thing about it; or had he made any kind of claim, or hinted an apprehension of being anticipated, I would either have suppressed my book, or have mentioned their names in it; in the manner I now do; that is, I would have said that I had conversed with Mr. Hunter on the subject, and that I found our sentiments to be much the same. I should not have supposed that my judgment could have suffered any disparagement by its being known, that I thought on an anatomical subject in the same manner as Dr. Hunter or his brother did, neither should I have made the least scruple of saying so: and as to the honour of the discovery, it would not have given me any concern at all.

This is a short and true account of the fact; this is the thing for which I have been traduced in print, as a plagiarist, and

for which Dr. Hunter has taken a liberty with me, which he can have no right to take.

The doctor has charged me with having been guilty of a double theft; one committed on himself, thro' his brother; and one on Baron Haller: the latter is said to be contained in my general treatise, published in 1756, the former in a little tract already referred to, and published in 1757^d. One of these Dr. Hunter has really nothing to do with, even if his supposition was true, which it is not; the other he ought to have inquired better into, before he had so positively, as well as rudely, asserted any thing concerning it. He might then have prevented me from saying that he has published his ill-grounded suspicions for facts; and has unjustly endeavoured to injure the character of one whom he calls his *friend*.

The truth with regard to the former is, that Dr. Hunter having received from Haller his first information of what he afterwards takes the liberty of calling his *own hypothesis* of the congenial hernia^e,
takes

^d An account of a particular kind of rupture, &c.

^e See Medical Commentary, p. 72.

takes it for granted that I must have done the same ; which though it might have been true, was not. It is very certain that the baron's *Opuscula* had not only been published in Latin, but had, as the doctor observes, been also translated into English; but notwithstanding this, it so happened that I had never seen them.

To save the reader's time, and to cut short this part of the dispute, I do aver, that I never had seen, read, or heard of the book in either language, till some time after the publication of my pamphlet on that subject; I therefore did not, nor could borrow any part of the contents, either of that, or of my former treatise, from it: the manner in which I attained my knowledge I have already most faithfully related, and therefore think myself intitled to the reader's credit. But setting aside whatever pretension I may have to be believed upon my bare assertion ; is it probable that if I had stolen my opinion from the baron's book, that I should have given so short, so imperfect, and indeed so erroneous an account of what he has so fully explained, or at least so clearly pointed out?

If I had taken my account of the descent of the testicles from thence, why did I not also learn from thence the reason why the intestine and testicle are sometimes found in the same sacculus? one of these facts was as much the subject of my inquiry at that time, as the other; and in the *Opuscula Pathologica*, (the book alluded to) are both of them satisfactorily accounted for, and made to illustrate each other. Why should I call the case related by Mr. Sharp a *lusus naturæ*? why steal only one half of Haller's discovery? why not avail myself thoroughly of the plagiarism by giving a true solution of the appearance, showing that it was not a *lusus naturæ*, nor produced by what Mr. Sharp and Dr. Hunter had thought was the cause of it, but by the intestine being pushed into the open tunica vaginalis? All this is in the same chapter of the same book; from this book Dr. Hunter and his brother derived all their knowledge of both these subjects; and this book (if I had read it) must have informed me of both, as certainly as of one. Is Haller's account of one more plain and intelligible than of the other?

other? or is it likely that I should read only what related to one, and not what related to the other, when they were not only in the same chapter and page, but equally parts of the subject I was then inquiring into.

Indeed the spirit of criticism, or more properly the desire of finding fault, has in this instance got the better of that artful caution, with which Dr. Hunter most frequently either expresses or conceals his sentiments; has carried him beyond the proper mark, and made him prove too much; since if I had read the *Opuscula Parthologica* of Haller, previous to the publication of my general treatise in 1756, I must have obtained from thence that very information which the doctor says I got from his brother in 1757, at the time when he is said to have explained to me the doctor's hypothesis; for in that book, as I have already observed, are contained both the doctor's *hypothesis*, (as he calls it) and Mr. Hunter's discovery.

I am very willing to allow that Dr. Hunter might reasonably presume that I had seen the *Opuscula*; but is such pre-

sumption to be immediately admitted as a proof; or can it be thought sufficient to authorise or vindicate so rude and so unprovoked an attack as he has made on me? If I had borrowed from any publication of his, there might have been some reason for his being so alarmed, some excuse for his jealousy; but how was he injured by a supposed, or even by a real theft committed on Haller? Is it a mere virtuous dislike of plagiarism, which actuates the doctor upon this occasion, or is he determined that nobody but himself shall make free with the Baron?

The doctor is so obliging as to say, that my performance “astonished him, if possible, more than professor Monro’s on the lymphatics had done; that it contained hardly one new idea; that it might have been written by any of his pupils; that I had mentioned neither his, nor his brother’s name in it; and that it bore in its composition the evident marks of *second-hand observation*, and of *time-serving hurry*.”

This is such a specimen of good-manners, as well as of good-writing; the charge
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is so civil, so modest, and made in so decent and gentleman-like language, that I am almost sorry to be obliged to contradict it.

I do indeed most sincerely wish that some one of the doctor's pupils had prevented me from being engaged in this affair, by having published what, *he says, they all knew*; to which he might have added, *and they only*; for the rest of the medical world were so totally unacquainted with the subject, that mean and trite as my performance was, I received the thanks of many, I might say most of the practitioners of eminence, both in physick and surgery, for it. They acknowledged themselves pleased and informed, and thought that it furnished them with a new idea; and what is more, do still continue to think so, notwithstanding the doctor's assertion.

The not having mentioned the doctor's name is a crime indeed. That any man at this time should dare to publish any thing in anatomy without paying doctor Hunter his tribute of praise! more especially as I had had some conversation with his brother on the subject. This latter
consideration

consideration induces me to acknowledge, that I really wish I had related what passed; more especially as the doctor thinks, or at least insinuates, that I concealed it with design to anticipate him, and to prevent him from enjoying the honour of what he chuses to call his own hypothesis.

I do assure him that this was not my motive, and that I had no such intention: but supposing that I had; supposing that not having read Haller, nor having by my own inquiry attained a true knowledge of the subject, I had really regarded Dr. Hunter and his brother as the discoverers of these truths, and had made up my pamphlet with what I had purloined from my conversation with the latter: I say, supposing all this, I do not see how either of these gentlemen can with any degree of candor charge me with having prevented them from enjoying the honour of a discovery. The theft would have indeed been palpable on my side, had this been the case, but could either the doctor or his brother, (who must be conscious that they had borrowed all their information from
Haller)

Haller) have said that I had robbed them of what was their own original property? surely not: and yet (to return some part of my *friend's tender concern* for me) I am sorry to say, that one of his complaints against me, seems to imply that he would.

The last part of the doctor's charge against me, and which he has put in italics, lest an inattentive reader should overlook it, is, that my tract bore in its composition the evident marks of *second-hand observation*, and of *time-serving hurry*.

The elegance and gentility of this language are so obvious, as to need no remark; and I dare believe that every reader, who has either ear, or taste, would have attended to it without the change of type. The doctor is a good-natured man, and only wishes to correct the errors of his friends, without hurting or offending them by his manner of doing it; and as I cannot help thinking myself under some obligations of this kind to him, I am sorry that in this instance, in which he has strained his imagination for a choice phrase, and has taken particular care to engage the reader's attention to it, I should be under a necessity of saying that it conveys a re-

fection which is unjust, and not founded on truth: but baron Haller's *Opuscula* having been published before my pamphlet, could not be anticipated by it; and as I had not the least intimation that either Dr. Hunter or his brother, or indeed that any body intended to write on the subject, I must take the liberty of repeating, that the epithet *time-serving*, altho' it be a very expressive one; and one whose *use* and *importance* I am very willing to allow the doctor to be perfectly well acquainted with, is applied in this instance without truth or justice, and only serves to prove how apt we are to make our own conduct the rule whereby to judge of that of others.

Whoever has read that chapter of the Medical Commentary which relates to me, and has attended to the sneer in some part of it, and the acrimony in others, must necessarily suppose that my conduct, with regard to Dr. Hunter, has been such, as to deserve this kind of treatment; especially when they recollect that it comes from a gentleman, whose appearance is all mildness and modesty; but excepting that single circumstance of not having related the short conversation which passed between

tween his brother and me, and from which I did not derive the least degree of information, I am not conscious of any thing which should incite him to draw his tremendous pen against me, or to treat me in so illiberal a manner. It is very true that the doctor has been charged with having had a dispute *with me*; but before he took this strange liberty, ought he not to have recollected, that he never was so charged *by me*? and that I am by no means accountable for the use which another may make of my name? Ought not the doctor to have asked me whether I had permitted or approved of it^f? Surely this was

^f Although I cannot think that Dr. Hunter's behaviour can intitle him to any explanation from me, yet to prevent any misconception in the reader, and to give the doctor all possible satisfaction, I do assure him, that when Dr. Monro mentioned my name among others with whom he supposed Dr. Hunter to be engaged in a dispute, he did it without any correspondence, communication, or permission from me, nor did I know any thing of it till I saw it in print. That gentleman, I suppose, among many others, took it for granted, that the remarks which had appeared in the Critical Review, on my pamphlet, were Dr. Hunter's, or published with his knowledge and approbation, and therefore looked upon him as having begun a dispute with me. What reason they, who have known

was due both to my character, and to his own. Had he thought proper to have asked me any questions relative to my conduct, I would have given him a satisfactory answer; but this he chose to avoid, and hastily taking for granted what was not true, and what he ought coolly to have inquired into; he suffered his pride to hurry him into an indecency, very unbecoming a man of science, or a candid inquirer into truth; and (to use his own words) *wantonly sought a dispute with me.*

Soon after the publication of my pamphlet, some remarks were, as I have already observed, made on it in the Critical Review^s, which represented me in no very advantageous light. These the doctor justly observes *could not be very pleasing to me*; and he expresses some surprize that they did not draw from me a justification. I believe the whole world, and even the Reviewers themselves, will allow, that an anonymous writer has no just claim to an answer.

known Dr. Hunter longest, had to suspect him of being capable of publishing anonymous reflections on the performance of his *friends*, he and they best know.

^s March and May, 1757.

answer. If the observations which appeared in that paper were really the doctor's own, (which I have now more than one good reason for believing; and which all who read, and will compare them with what has since appeared in the Medical Commentary, will, I fear, be convinced of) I say, if these were the doctor's own, why did he not stand forth like a man, and sign them? why did he hide himself behind a feigned and a nameless character, and strike at me in the dark? If I had injured, or defrauded him, he had a right to resent it, and ought to have done it openly: if I had not, and his apprehensions were merely the result of vanity and suspicion, his remarks were ill-founded, and it would have been more prudent to have suppressed them.

The doctor says, that he complained of me at his lecture, and that every one to whom he mentioned the thing was much surprized at it. I am really at a loss to say which has been most surprizing to me, the doctor's having made such complaint, or his not having been ashamed to acknowledge it. Why make an appeal to a set of people, who could not possibly know any thing

thing of the matter, or at least as it related to me? nor whether the complaint was well or ill founded? Why should Dr. Hunter be so vain to imagine that his *ipse dixit* must be implicitly believed by all who heard him? or if he did believe that it would, was it not disingenuous to make use of such influence, and endeavour to set me in a contemptible light to his hearers, without having once mentioned the thing to me, or hearing what I had to say in my own vindication. If he had spoken to me, and I had refused giving him a satisfactory answer; or if I had given him a false, or an evasive one; if I had lived in a country far distant from that of his residence; if there had been any previous animosity between us, he might have had recourse to this unmanly method, and it might possibly have been justifiable: but as I was at hand; had never received an affront from, or offered one to the doctor; as he had no good reason to suppose me either afraid or ashamed to have come to any eclarcissement, which he might have thought proper to have required of me; he must give me leave to say, (as I always shall)

shall) that this method of telling his *tale* to the young people at his lecture-room, and of endeavouring to represent me to them in a contemptible light, without having previously spoken to me, was disingenuous, and equally unbecoming a man of candor, or a man of spirit^b. The doctor might meet with some among his pupils, who having heard only his story, might think me blameable; but I can with strict truth assure him, that even in that small body of people, there were at that time several who were disgusted at the apparent male-

^b Whoever furnished the Critical Review with remarks on my pamphlet (doctor or doctor's pupil) misled the Reviewers, and was guilty of propagating a falsehood, when he authorized them to tell the publick, that Dr. Hunter had appealed *to me* concerning my conduct. The doctor knows that he never did. In the Medical Commentary, speaking of my erroneous account of the time of the descent of the testes, and of my supposed theft from Haller, the doctor says, that "the subject appeared "to him *too delicate for conversation.*" But tho' it was too delicate for conversation, even with a man whom he dignifies with the respectable name of *friend*, yet it did not appear too delicate to be made the subject of an anonymous piece of satire. What an idea of *delicacy*, as well as of *friendship*, does this convey! *Hic nigra succus liginis; hæc est Ærugo mera.*

malevolence of the appeal, and who if they had not been restrained *by me*, would have spoken to him about it.

An attack made on me without either real foundation, or personal provocation, has drawn from me this apology, in which I may possibly be thought to have expressed myself freely, but I hope not rudely: that degree of resentment which every man may be allowed to feel, when he thinks himself ill-used, will vindicate the former; and the unwarrantable liberty taken with me, would almost excuse the latter.

As I did neither *wantonly seek* this dispute, nor begin it, so having now said all that I know, or think concerning it, I am determined never to write another word on the subject; I therefore take my leave of it for ever, assuring both Dr. Hunter and his brother, that when I published my tract on the congenial hernia, I had no intention to anticipate either of them, or to prevent either of them from enjoying any reputation, or honour, which might arise to them from their labours on this, or any other subject; on the contrary, when I present-

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ed my first treatise to the doctor, if he had been so friendly as to have hinted to me his suspicion of my having borrowed from Haller; or to have said, that he, or his brother, was then inquiring into that part of the animal œconomy, I would not only have given him a true answer to the former, but should most probably never have prosecuted my inquiries into the latter, as I should have thereby known that the subject was in so able hands: I wanted no reputation of that sort; but as I thought that I had accidentally hit upon a truth in which mankind were not a little interested, so I thought it my duty to publish it. If my account was erroneous, it certainly deserved correction; but that correction might have been made with civility and candor, not in the manner in which the doctor, or his *nameless* pupil attempted it; if I had then been displeased, the fault would have been mine, and no blame could have justly been laid on the corrector. The man who is offendedⁱ by a civil offer of information, has

ⁱ I had so little suspicion that the contents of my tract on the congenial hernia could possibly prove offensive to Dr. Hunter, that I sent one of them to him before publication,

has more vanity than sense; but he who tacitly and tamely submits to an attempt toward rendering him contemptible (by whomsoever made) does thereby become so.

I beg the reader's pardon, and proceed to give a short account of the disease, with some practical observations thereon.

THE manner in which a common hernial sac is formed, has already in a former chapter been related, viz. by the thrusting forth of a portion of the peritoneum through the opening in the tendon of the external oblique muscle of the abdomen; which portion so thrust forth, contains a piece of intestine, or omentum, or both.

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lication, as to one of my friends to whom I would wish to show a civility. I had neither mentioned his name with disrespect, nor suppressed the mention of it, from any sinister motive, but merely from not thinking it necessary. If I had spoken of him in it in a manner which *could not have been pleasing* to him, I should have been contented with his meeting with it after it had been published, and should have thought that by sending it to him, I had added an *insult* to an *injury*.

The doctor will give me leave to embrace this opportunity of thanking him for the present of his Medical Commentary, which he was so obliging as to send to me.

A hernial sac thus formed, always communicates with the cavity of the belly, but never with that of the tunica vaginalis testis. It passes down anterior to the spermatic chord, and when it is laid open, is found to contain only a portion of gut, or caul, and a small quantity of fluid.

On the contrary, the sac of a congenial hernia is formed by the tunica vaginalis testis itself; and when it is laid open, (whatever else may be in it) it is always found to contain the testicle, covered only by its proper coat, commonly called tunica albuginea.

The manner in which this is brought about, the original or early situation of the testes in a fœtus, their descent, their protrusion from the cavity of the belly, and the formation of the tunica vaginalis testis, I have described so much at large in two tracts already published, that I shall give a very short account of them in this place.

That

* An account of the congenial hernia, published in 1757; and some observations on the hydrocele, published in 1762. In Dr. Hunter's Medical Comment, No. 1, may also be seen a very ingenious account of this matter, by his brother Mr. John Hunter.

That bag which is designed to make the future tunica vaginalis testis, is an originally formed part, lies in the groin, under the skin and adipose membrane, and has an orifice always open to the abdomen of a fœtus. By means of this orifice, the testicle at proper time descends, into the groin first, and then most commonly into the scrotum, and when it has been some little time in the latter, the opening from the belly generally becomes close, and is obliterated. By the closing of this passage, a bag or cavity is formed, which contains within it, the testicle covered only by its tunica albuginea, and which bag never afterward has any communication with the orifice into the cavity of the belly.

The time at which the testicles are thrust forth from the belly is very uncertain, as I have often experienced; and so is that of the absolute closing of the sacculus. In some they pass out before birth, in some immediately after, and in some not till some time after. In some they never pass out at all, and in others, they (that is the two) arrive in the groin, or scrotum, at different, and sometimes very distant times. In short, the intention of nature, and her process, is
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in general regular and plain, but it is accomplished at different periods, in different persons, and sometimes, like most other parts of the animal œconomy, it is totally prevented by accident, or mal-formation.

The intrusion of a piece of intestine, or omentum, into the orifice of the tunica vaginalis is one of these accidents. By means of either of these, the closing of the passage is prevented, and a hernial sac of a particular kind formed. This sac being really the vaginal coat of the testis, must if that body has fallen from the abdomen, contain the intestine, omentum, or whatever forms the hernia, and the testicle, in immediate contact with each other.

This is the congenial hernia; a disease unknown till within these few years, but by no means an infrequent one.

The appearance of a hernia in very early infancy, will always make it probable that it is of this kind; but in an adult, there is no reason for supposing his rupture to be of this sort, but his having been afflicted with it from his infancy; there is no external mark, or character, whereby it

can be certainly distinguished from one contained in a common hernial sac; neither would it be of any material use in practice, if there was.

When returnable, it ought like all other kinds of ruptures to be reduced, and constantly kept up by a proper bandage; and when attended with symptoms of stricture, it requires the same chirurgic assistance, as the common hernia.

In very young children, there are some circumstances relative to this kind of rupture, which are very well worth attending to, as they may prove of very material consequence to the patient.

A piece of intestine, or omentum, may get pretty low down in the sac; while the testicle is still in the groin, or even within the abdomen; both which I have seen. In this case, the application of a truss would be highly improper; for in the latter, it might prevent the descent of the testicle from the belly into the scrotum; in the former, it must necessarily bruise and injure it, give a great deal of unnecessary pain, and can prove of no real use. Such bandage therefore ought never to be applied, on a rupture in an infant, unless

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the testicle can be fairly felt in the scrotum, after the gut or caul is replaced ; and when it can be so felt, a truss can never be put on too soon.

As this kind of rupture is subject to stricture with all its consequences, as much as that which is contained in a common hernial sac, and therefore liable to stand in need of the chirurgic operation ; it may be very well worth an operator's while to know, that an old rupture, which was originally congenial, is subject to a stricture made by the sac itself, independent of the abdominal tendon, as well as to that made by the said tendon.

Whether this be owing to the weight of the testicle at the bottom of the sac, and the endeavours which nature makes to close the upper part of the tunica vaginalis, or to what other cause, I will not pretend to say, but the fact I have several times noticed, both in the dead and in the living. I have seen such stricture made by the sac of one of these herniæ, as produced all those bad symptoms, which render the operation necessary ; and I have met with two different strictures, at near an inch distance from each other, in the body of a
dead

dead boy about fourteen, one of which begirt the intestine so tight, that I could not disengage it without dividing the sac.

In this kind of hernia I have also more frequently found connections and adhesions of the parts to each other, than in the common one; but there is one kind of connection, sometimes met with in the congenial hernia, which can never be found in that which is in a common hernial sac, and which may require all the dexterity of an operator to set free; I mean that of the intestine with the testicle, from which I have more than once experienced a good deal of trouble.

When a common hernial sac has been laid open, and the intestine and omentum have been replaced, there can be nothing left in it which can require particular regard from the surgeon; but by the division of the sac of a congenial hernia, the testicle is laid bare, and after the parts composing the hernia have been reduced, will require great regard, and tenderness, in all the future dressings, as it is a part very irritable, and very susceptible of pain, inflammation, &c.

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If a large quantity of fluid should be collected in the sac of a congenial hernia, and by adhesions and connections of the parts within, the entrance into it from the abdomen should be totally closed, (a case which I have twice seen) the tightness of the tumor, the difficulty of distinguishing the testicle, and the fluctuation of the fluid, may occasion it to be mistaken for a common hydrocele; and if without attending to other circumstances, but trusting merely to the feel and look of the scrotum, a puncture be hastily made, it may create a great deal of trouble, and possibly do fatal mischief.

By what has fallen within my observation, I am inclined to believe that the sac of a congenial hernia is very seldom, if ever, distended to the degree which a common hernial sac often is: it also, from being less dilated, and rather more confined by the upper part of the spermatic process, generally preserves a pyriform kind of figure, and, for the same reason, is also generally thinner, and will therefore require more attention and dexterity in an operator when he is to open it. To
which

which I believe I may add, that common ruptures, or those in a common sac, are generally gradually formed, that is, they are first inguinal, and by degrees become scrotal; but the congenial are seldom, if ever, remembered by the patient to have been in the groin only.

S E C T I O N X I.

Exomphalos.

THE Exomphalos, or Umbilical rupture, is so called from its situation, and has, like the other, for its general contents, a portion of intestine, or omentum, or both. In old umbilical ruptures, the quantity of omentum is sometimes very great.

Mr. Ranby says, that he found two ells and half of intestine in one of these, with about a third part of the stomach, all adhering together.

Mr. Gay, and Mr. Nourse found the liver in the sac of an umbilical hernia; and Bohnius says that he did also.

But whatever are the contents, they are originally contained in a sac, formed by the protrusion of the peritoneum.

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In recent, and small ruptures, this sac is very visible; but in old, and large ones, it is broken through at the knot of the navel, by the pressure and weight of the contents, and is not always to be distinguished, which is the reason why it has by some been doubted whether this kind of rupture has a hernial sac or not.

Infants are very subject to this disease, in a small degree, from the separation of the funiculus; but in general they either get rid of it as they gather strength, or are easily cured by wearing a proper bandage. It is of still more consequence to get this disorder cured in females, even than in males, that its return when they are become adult, and pregnant, may be prevented as much as possible; for at this time it often happens, from the too great distention of the belly, or from unguarded motion when the parts are upon the stretch. During gestation it is often very troublesome, but after delivery, if the contents have contracted no adhesion, they will often return, and may be kept in their place by a proper bandage.

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If such bandage was always put on in time, and worn constantly, the disease might in general be kept within moderate bounds, and some of the very terrible consequences which often attend it might be prevented. The woman who has the smallest degree of it, and who from her age and situation has reason to expect children after its appearance, should be particularly careful to keep it restrained.

In some the entrance of the sac is large, and the parts easily reducible; in others they are difficult, and in some absolutely irreducible. Of the last kind many have been suspended for years in a proper bag, and have given little or no trouble. They who are afflicted with this disorder, who are advanced in life, and in whom it is large, are generally subject to cholics, diarrheas, and if the intestinal passage be at all obstructed, to very troublesome vomitings¹. It therefore behoves such to take great care to keep that tube as clean and free as possible, and neither to eat or drink any thing likely to make any disturbance in that part.

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¹ On which account they are often supposed to labour under a stricture of the intestine, when they really do not.

The cure, as proposed by authors, is either radical, or palliative.

Celsus, Paulus Ægineta, Albucasis, Aquapendens, Guido, Severinus, Rolandus, and others, mention a radical cure by ligature; Fab. ab Aquapendente proposes, "aut medicamentis aut ferro umbilicum adurere;" but after having described both methods, he lays them under such restraints, from age, habit, size of the tumor, time of the year, &c. as amounts almost to a prohibition against putting them in practice at all; and it is to be hoped that no body will attempt to revive them.

The methods by ligature are two; in the one, the skin covering the tumor is to be lifted up with the finger and thumb, or with a small hook, to free it from the intestine underneath, and then a ligature is to be made round the basis of the tumor, so strict as to procure a mortification of all that part which is anterior to such ligature. In the other, the skin is to be elevated in the same manner, and a needle, armed with a double ligature, is to be passed through the basis of the tumor, which
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is to be tied above and below, or on each side, so tight as to produce the same effect. Previous to the drawing the ligature close, it is advised to make a small incision in the top of the tumor, large enough to pass in the end of the fore-finger, and with it so to depress the intestine, or omentum, as to prevent their being engaged in the stricture.

The intention in both these methods, is the same, viz. by destroying the lax skin covering the top of the tumor, to produce a cicatrix which shall bind so tight, as to restrain the parts from any future protrusion.

The objections to either of them are so obvious, that it is hardly necessary to say any thing concerning them; though in this age of quackery and credulity, I should not wonder to see them revived, and practised.

In young subjects, and small herniæ, a bandage worn a proper time, generally proves a perfect cure; and in old persons, and large tumors, it is hardly to be supposed that any body can think of any but
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a palliative cure, the hazard of producing a mortification being so great.

But suppose the subject to be young, and the tumor of such size, and in such state, as to make it unlikely that a bandage would do more than palliate; that the skin covering the tumor is so lax, as to make it improbable that it should ever recover its former state, and lie smooth, and that when it has been removed, the cicatrix shall bind so tight, as to prevent the future protrusion of any of the contained parts; yet who can tell what may be the consequence of this destruction of parts, and this indilatibility of the skin in a state of pregnancy. I mention this because I have seen very terrible mischief, from the bursting of a cicatrix on the navel, during gestation; though the scar was from an abscess, opened by incision, and consequently could not be supposed to be equal, either in size or resistance, to one produced by the before-mentioned operation.

The umbilical, like the inguinal hernia, becomes the subject of chirurgic operation, when the parts are irreducible, by the hand

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only, and are so bound as to produce bad symptoms. But though I have in the inguinal and scrotal hernia, advised the early use of the knife, I cannot press it so much in this; the success of it is very rare, and I should make it the last remedy. Indeed I am much inclined to believe, that the bad symptoms, which attend these cases, are most frequently owing to disorders in the intestinal canal, and not so often to a stricture made on it at the navel, as is supposed. I do not say that the latter does not sometimes happen, it certainly does; but it is often believed to be the case when it is not.

When the operation becomes necessary, it consists in dividing the skin and hernial sac, in such manner as shall set the intestine free from stricture, and enable the surgeon to return it into the abdomen, if sound, and not adherent; but if it be gangrenous, or mortified, the altered part must be removed, and the faecal discharge be derived through the wound; by which means, some few have preserved their lives, if such state can be called living.

SECTION .

S E C T I O N XII.

Ventral Hernia, &c.

THIS may appear in almost any point of the fore-part of the belly, but is most frequently found in or between the recti muscles.

The portion of intestine, &c. is always contained in a sac, made by the protrusion of the peritoneum. When reduced, it should be kept in its place by bandage, and if attended with stricture, which cannot otherwise be relieved, that stricture must be carefully divided.

The hernia Foraminis Ovalis, I have never seen.

All the parts almost which are contained in the belly, or pelvis, are by the dilatation of their connecting membranes, capable of being thrust forth, and of producing swellings, all which are called herniæ.

Ruyfch gives an account of an impregnated uterus being found on the outside of the abdominal opening; and so does Hil-

danus and Sennertus. Ruysch also gives an account of an intire spleen having passed the tendon of the oblique muscle. And I have myself seen the ovaria removed by incision, after they had been some months in the groin.

The urinary bladder is also liable to be thrust forth, from its proper situation, either through the opening in the oblique muscle, like the inguinal hernia, or under Poupart's ligament, in the same manner as the femoral.

This is not a very frequent species of hernia, but does happen, and has as plain and determined a character as any other.

It has been mentioned by Bartholin, T. Dom. Sala, Platerus, Bonetus, Ruysch, Petit, Merry, Vardier, &c. in one of the histories given by the latter, the urachus, and impervious umbilical artery on the left side, were drawn through the tendon into the scrotum, with the bladder: in another he found four calculi.

Ruysch gives an account of one complicated with a mortified bubonocoele. Mr. Petit says he felt several calculi in one, which

which were afterwards discharged through the urethra.

Bartholin speaks of T. Dom. Sala as the first discoverer of the disease, and quotes a case from him, in which the patient had all the symptoms of a stone in his bladder; the stone could never be felt by the *sound*, but was found in the bladder (which had passed into the groin) after death.

As the bladder is only covered in part by the peritoneum, and must insinuate itself between that membrane, and the oblique muscle, in order to pass the opening in the tendon, it is plain that the hernia cystica can have no sac; and that when complicated with a bubonocoele, that portion of the bladder which forms the cystic hernia must lie between the intestinal hernia, and the spermatic chord, that is, the intestinal hernia must be anterior to the cystic.

A cystic hernia may indeed be the cause of an intestinal one; for when so much of the bladder has passed the ring, as to drag in the upper and hinder part of it, the peritoneum which covers that part must follow, and by that means a sac be formed

for the reception of a portion of gut or caul. Hence the different situation of the two herniæ in the same subject.

While recent, this kind of hernia is easily reducible, and may, like the others, be kept within by a proper bandage; but when it is of any date, or has arrived to any considerable size, the urine cannot be discharged, without lifting up, and compressing the scrotum; the outer surface of the bladder is now become adherent to the cellular membrane, and the patient must be contented with a suspensary bag.

In case of complication with a bubonocoele, if the operation becomes necessary, great care must be taken not to open the bladder instead of the sac, to which it must lay anterior. And it may also sometimes by the inattentive be mistaken for a hydrocele, and by being treated as such may be the occasion of great, or even fatal mischief.

SECTION

SECTION XIII.

Attempts toward a radical Cure.

IN the first section of this treatise, I have said that the means used to obtain both a palliative and a radical cure were exactly the same, and that the event was dependent on many circumstances, which a surgeon could neither direct nor alter; such as the age of the patient, the date of the rupture, the thickness of the hernial sac, the size of the abdominal openings, &c.

They who are unacquainted with the history of this disease, may possibly be surprised at this assertion, and be thereby induced to believe, what has in all times been so confidently asserted, viz. that there are methods and medicines, whereby this disease may always be perfectly cured, and that the surgeons, either through indolence, will not get information of them, or through obstinacy will not practise them. If either of these charges was true, it must

be the latter, for we certainly do know what attempts of this kind have been made; and if any of these means had really deserved the character which has been given of them, had been safely practicable, or had proved generally successful, I should certainly have spoken of them in their proper place: but this is so far from being the case, that on the contrary, however they may have been applauded by a few individuals, they have upon repeated experiment been found unfit for general practice, being either totally inefficacious, or painfully mischievous. The majority, nay, almost all they who have submitted to, or tried them, have remained uncured of their disease, or have been mutilated, or murdered in the attempt.

Several of these methods have indeed the sanction of antiquity, and have been described, and even practised by many of the old surgeons: the principal of these, or they which are most worthy of notice, are the *cure by cautery*; the *cure by caustic*; *that by castration*; the *punctum aureum*; the *royal stitch*; and the *cure by incision*.

In

• In Avicenna, Albucasis, Paulus Ægineta, Fab. ab Aquapendente, Guido de Cauliacco, Severinus, Theodoric, Rolandus, Serjeant Wiseman, and others, will be found the *cure by cautery*, which is performed as follows.

After a proper time spent in fasting and purging, the patient must be put into an erect posture, and by coughing, or sneezing, is to make the intestine project in the groin as much as possible; when the place, and circumference of such projection is to be marked out with ink. Then the patient being laid upon his back, the intestine is to be returned fairly into the belly, and a red-hot cautery is to be applied according to the extent of the marked line. For this purpose, cauteries of different sizes, shapes, and figures, have been devised; annular, elliptical, circular, like the Greek letter Gamma, &c. The writers who have given an account of this operation, have differed a good deal from each other, not only in the size and figure of the cautery, but in the depth of its effect. Some have directed it to be repeated, so as to denude the os pubis;

bis; others direct that the skin only be destroyed by the iron; the cellular membrane, sac, periosteum, &c. with repeated escharotic applications. But in all of them the exfoliation^p of the bone is made a necessary part of the process; the eschar, and sloughs, being separated, and the exfoliation cast off, the patient is ordered to observe an extremely strict regimen, to lie on his back during the cure, and to wear a bandage for some time after, in order to prevent a new descent of the parts, which notwithstanding all the pain, and all the hazard the patient had undergone, he was still liable to.

The cure by caustic seems to have succeeded to that by cautery, and is described by most of the same writers, particularly by Guido, Severinus, Lanfranc, Parey, Theodoric, Scultetus, &c.

The

^p Albucasis says, "Et scias quod quando tu non consequeris os cum cauterio, non confert operatio tua."

Rolandus orders the cautery to be used in the same manner; so do Guido, Theodoric, &c.

Brunus says, "Si non fuerit os consecutum, in primâ vice, tunc iterum cauterium vice aliâ, donec consequeris; quia si non consecutum fuerit os, cum cauterio, parum confert operatio tua."

The patient being laid on his back, and the parts returned into the belly, a piece of caustic is to be applied on the skin, covering the opening in the abdominal tendon, so large as to produce an eschar, about the size of a half crown.

Some suffer this eschar to separate, others divide it, and then by the repeated applications of escharotics, destroy the membrana cellularis, with as much of the hernial sac as can be done, without injuring the spermatic vessels. For this purpose, different kinds of corrosive applications have been made use of: pastes loaded with sublimate, or arsenick; the stirpes brassicæ, burnt; the tithymalus; the lapis infernalis alone, or with suet and opium; oil of vitriol, with many others, according to the humor of the operator. But though the means are somewhat different from each other, the end or intention in the use of them all is the same, viz. to remove or destroy the skin, and cellular membrane, covering the tumor, together with a part of the hernial sac, and by that means to procure such an incarnation, as by its firmness, and its attachment to the bone, and
parts

parts adjacent, shall prevent a new descent of either gut or caul.

The mere relation of one of these methods is sufficient to shock any humane, or ingenious man. The horror attending the use of the cautery must be great, to say nothing of the extreme uncertainty of the size or depth of the eschar; the apprehension from the caustic will be less indeed, but the pain must be nearly as great, and of much longer duration.

The parts to be destroyed are, as I have just said, the skin, the membrana adiposa, part of the hernial sac, and the periosteum covering the os pubis; and this is to be accomplished without injuring the spermatic vessels, or the tendon of the abdominal muscle.

If the spermatic vessels are hurt, an inflamed or diseased testicle will be the consequence; if they are destroyed, the testicle will become useless. If the tendon of the oblique muscle be injured, either by the iron, or by the caustic, terrible sloughs, a large ill-conditioned sore, and a brisk symptomatic fever must be expected, which in some habits must be productive of considerable

considerable mischief: and that considerable mischief was often done by these processes, may be learned from the very writers who describe them¹.

If

¹ Guido speaking of the cure by caustic says, "In quo summe cavendum est quod dominus sit de corrosivo; si enim indocte applicatur, febrim commovet, et accidentia mala." That great pain, defluxion on the hæmorrhoidal vessels, and inflammation and swelling of the scrotum, were often the consequence of these attempts, may be learned from the same author, who, speaking of the method of applying the caustic, says, "Et ita continue fiat quousque caro miracis tota sit corrupta, usque ad Didymum quod cognoscitur per inflationem bursæ, et testiculorum." And that the caustic has gone deep enough, he gives the following proof, "Quod cognoscetur per majorem tumorem testiculi, et per majorem dolorem dorsi et partium posteriorum." Brunus says, "Et cave summam diligentiam, ne in hora cauterizationis exeat intestinum, et comburatur." Lanfranc, speaking of the ill effect of the caustic in some habits, says, "Et sic multi spasmantur, et spasmati subito moriuntur." Fab. ab Aquapendente says, "Quæ tamen chirurgiæ uti videtis, difficiles admodum sunt, et inter subtilissimas haberi possunt; quo fit ut plerique patientes affectus perpetuo gestare quam his chirurgis submittere se vellent." And in another place, "Quæ porro chirurgiæ vehementem dolorem afferunt et satis difficiles sunt." In short, whoever will take the trouble of reading the old writers on this subject will, even from their own account, be satisfied, both of the pain, hazard, and inefficacy of all these methods.

If the os pubis be laid bare, whether by cautery, or by caustic, some of the before-mentioned hazards must be incurred; if it be not, the intention will in general be frustrated; that is, the intestine will slip down behind the scar, and put the patient under the same necessity of wearing a bandage, as he lay under before he submitted to so painful and so hazardous an experiment.

If the preservation of life was the object of these means, something might be said in their vindication; the anceps remedium must for ever be preferable to desperation; but that is not the case; they are recommended to be put in practice, when the patient's life is in no kind of danger, and are designed merely to save him the trouble of wearing a truss; which purpose they can seldom answer; for it is well known, that after the use of the cautery, caustic, and every method, either proposed for a radical cure, or used to rescue a ruptured patient from death, that the intestine will slip down behind the cicatrix, and form a new bubonocoele, which can only be kept up by a proper bandage.

The

The three other means made use of by the antients toward obtaining a radical cure, were the *punctum aureum*, the *royal stitch*, and *castration*.

The *punctum aureum* was performed as follows. The intestines being emptied by purging, and the hernia reduced, an incision was made thro' the skin, and membrana adiposa, down to the spermatic process. This incision was to be of such length, as to permit the operator, either with his finger, or with a hook to take up the said process, and to pass a golden wire under it; which wire was to be twisted in such a manner, as to prevent the intestine from slipping down again into the hernial sac, but not so tight as to intercept or obstruct the circulation of the blood to the testicle. Some operators preferred a leaden wire to a golden one, and others a filken ligature.

It may possibly seem rather uncivil to say, that both this and the succeeding operation were directed and practised by people who were very little acquainted with the true nature and structure of the parts they operated upon, or indeed of the disease,

case, for which they prescribed such operation; but had not that been the case, they never could have proposed so fallacious and uncertain a method of treating it: for if the wire, or whatever was passed round the process, did not bind pretty tight, it would not prevent a descent of the gut, and the whole operation, though painful and irksome, must become absolutely useless; if it did bind tight, it must necessarily retard or obstruct the circulation of the blood thro' the spermatic vessels, and produce a disease of them, and of the testicle'.

The royal stitch was performed in this manner: the intestines being emptied, and the portion which had descended being replaced, an incision was made in such manner, as to lay bare the spermatic chord, about two inches in length from the abdominal opening downward. When the process was freed from the cellular membrane, it was to be held up by an assistant, while

' Whoever would know the particular methods of executing this operation, may find them in Guido, Parey, Franco, Scultetus, Smaltzius, Purmannus, Nuek, &c. ,

while the surgeon with a needle and ligature made a continued future, from the lower part of the incision to the upper, in such manner as to unite the divided lips of the wound again, comprehending the cellular membrane, and thereby endeavouring to straiten the passage, as they called it, from the belly into the scrotum, without injuring the spermatic vessels.

The operation is described by many of the old writers^{*}, with some small variation from each other, both in the manner, and in the instruments; but all tending to the same end, and all proving that their idea of the disease, and of the parts affected by it, were erroneous and imperfect.

The fatigue to the patient must be greater in this than in the preceding operation, both on account of the large incision, and of the future.

In some habits either of them must be very hazardous, and in the majority of cases,

^{*} Paulus, Albucasis, Fab. ab Aquapendente, Guido, Rolandus, Parey, Serjeant Wiseman, &c. &c. &c.

cases, painful, troublesome, and tedious; which circumstances might nevertheless be submitted to, if the cure was certain, the contrary to which did most frequently happen, even by the confession of the very writers who propose and describe these methods, and who universally order the long wearing a truss after such operations have been submitted to.

Some, who thought that the stitch added unnecessarily to the pain, have directed the incision to be made in the same manner as for the future; but instead of sewing the lips together, have advised that the common membrane be dissected out pretty clean, and the sore digested and incarned. This is so like to the operation for the incarcerated bubonocoele, both in the manner of making the incision, and in its consequence, as tending toward a radical cure, that it may be looked upon as really the same thing; and how very fallacious and uncertain that operation proves toward answering this end is too well known.

Both these, the *royal stitch*, and the *punctum aureum*, proved often destructive

to the testicle, even in the most judicious hands, and when it got into those of ignorant pretenders, it proved most frequently so; for not knowing how to perform properly what they had undertaken, and finding it much more easy, after the incision was made, to slip out the testicle, they most commonly did so.

These are the principal methods proposed, or practised by our forefathers for a radical cure of a rupture; among the writers indeed will be found some trifling variations from each other in the execution of them, but the intention and aim is the same in all, viz. to prevent a new descent of either gut or caul, by producing an union of the parts, through which they either did, or were supposed to pass. According to the degree of anatomical knowledge, and humanity of the proposer, they will be found to be more or less rational and gentle, but are all of them painful, hazardous, and most frequently fallacious, and have therefore been totally disused by all modern practitioners, who have either knowledge, compassion, or honesty.

No disease has ever furnished such a constant succession of quacks as ruptures have; they who have had some smattering of anatomy or surgery, and whose humanity has not been their prevailing quality, have adopted one of the preceding operations, or something like them; while they who have had less knowledge, and more timidity, have had recourse to the more sneaking knavery of specific applications.

The histories of prior Cabriere, Bowles, Sir Thomas Renton, Dr. Little John, &c. &c. &c. to be found in Dionis, Houston, and other writers, will furnish to the reader an idea of the practice and performances of some of those who have stood at the head of those bold promisers: and our present news-papers daily supply us with a number of the lesser dealers in specific medicines, and new-invented bandages, by which the poor, and credulous, are gulled out of what little money they can spare. Operative quackery is not indeed so frequent, or so readily submitted to; but I wish I could not say that more than one
life

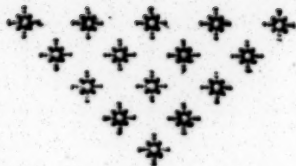
life had not been destroyed in our own time; by attempts to form and support the character of an operator in this disease; to this kind of hazard indeed the poor are luckily not so liable, as it can only be worth the while of these rupture-doctors to murder those who have before-hand been simple enough to pay them well for it.

This is a subject in which mankind are much interested, and on which a good deal might be said; but as an honest attempt to save the afflicted from the hands of those who have no character to lose, and whose only point is money, might, from one of the profession be misconstrued into malevolence and craft, I will not enter into it, but shall conclude, by wishing, that they who have capacity to judge of these matters, (which are as much the objects of common sense, as any other kind of knowledge) would not suffer themselves to be deluded by the impudent assertions of any Charlatan whatever, but determine in this as they do in many other things, that is, by the event. In short, if they who have so much credulity, as to be inclined

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clined to believe, and trust these lying impostors, would only defer the payment of them till they had completed their promises, the fallacy would soon be at an end.

F I N I S.



The Reader is desired to correct the following Errata.

- Page 5, l. 14, for *edges* read *edge*.
Page 17, l. 5, for *Epidydimus* read *Epidydimis*.
Page 34, l. 12, dele the second *of*.
Page 47, l. 24, for *even the* read *even of the*.
Page 49, l. 1, for *the* read *that*.
Page 54, l. 2, dele *the*.
Page 77, l. 8, for *late* read *too late*.
Page 83, l. 7, for *parts which bound it* read *the part which
was bound*.
Page 87, l. 7 of the note, read *more properly*.
Page 118, l. 8, for *lie* read *lay*.
Page 138, l. 19, for *them* read *it*.
Page 142, l. 20, for *membranorum* read *membranarum*.
Page 145, l. 24, for *shewed* read *showed*.

1/2